

PRELIMINARY ECOLOGICAL APPRAISAL

143 CORBY ROAD, WELDON, CORBY - AUGUST 2022



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CONTENTS

Non-Technical Summary.....	3
1. INTRODUCTION	6
2. METHODOLOGY	9
2.1 Desk Study and Data Consultation	9
2.2 Surveyor and Weather Conditions	9
2.3 Extended Phase 1 Habitat Survey	9
2.4 Protected and Key Species Survey	10
2.5 Impact Assessment.....	13
2.6 Limitations.....	15
2.7 Legislation.....	16
3. SURVEY FINDINGS AND EVALUATION	18
3.1 Desk Study	18
3.2 Phase 1 Habitat Survey	22
3.3 Protected Species and Other Species of Nature Conservation Importance.	22
3.4 Tree Roost Assessment.....	23
3.5 Great Crested Newt HSI Assessment.....	23
3.6 Preliminary Building Roost Assessment.....	23
3.7 Bat Survey.....	24
4. ECOLOGICAL EVALUATION AND RECOMMENDATIONS.....	25
5. AVOIDANCE, MITIGATION & COMPENSATION.....	30
6. BIODIVERSITY ENHANCEMENT.....	34
7. ECOLOGICAL CONDITIONS AND RECOMMENDATIONS FOR FURTHER SURVEYS	36
8. REFERENCES	37
Appendix 1 - Site Plans.....	38
Appendix 2 – Site Photos	40
Appendix 3 – Desk Study Data and Supplementary Information.....	41

Non-Technical Summary

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

Eco-Check was commissioned in May 2022 by Welland Design Build to undertake an ecological survey of land at 143 Corby Road, Weldon. The site is centred grid reference: SP91738954. An ecological walkover survey was conducted on 24th June 2022 to assess the ecological value of the site and the likely presence/absence of any protected species and provide recommendations for further investigations where necessary.

An ecological and protected species survey was conducted on 24th June 2022 by Steve Holland. An inspection was made of the proposed construction area to assess the ecological value of the site and the likely presence/absence of any protected species, UK/Northamptonshire BAP species and habitats and provide recommendations for further investigations where necessary.

The footprint of the proposed site development comprises almost entirely rough amenity grassland and residential garden with ornamental plants and shrubs. The site is surrounded by residential properties and woodland to the north.

Based on the habitat type present, it is considered that the site has potential to support the following protected species or groups of species: invertebrates (common and widespread species), nesting and breeding birds, common terrestrial mammals, reptiles and foraging/commuting bats.

In the absence of mitigation, the proposed development would give rise to a minor adverse impact on breeding birds, a minor adverse-neutral impact on small terrestrial mammals, habitats, invertebrates and foraging/commuting bats. The site is not within 2km of any SSSI designations. Mitigation has been proposed which would reduce the overall impact to minor adverse-neutral, including:

- Avoidance: Precautionary clearance of any tall ruderal vegetation and rank grassland; after cutting maintain the grassland at a short height (<100mm); creation of artificial refugia/hibernaculum along the edge habitats of the site; retention of all trees and hedging adjacent to the site; timing of demolition, vegetation clearance and ground works to avoid the bird nesting season 1st March to 31st August inclusive; trenches and excavations to be covered at night or a mammal ramp provided; no trees to be removed without a preliminary bat roost assessment (PRA) being undertaken; no groundworks or plant machinery within the RPA's of trees; building materials to be stored off the ground on pallets; sensitive lighting design in accordance with Bat Conservation Guidelines; measures to be taken to avoid killing/injuring of terrestrial mammals.
- Mitigation: Landscape planting to include native fruit and berry bearing trees, hedging, shrubs and plants which provide a nectar source to improve foraging resources for a range of invertebrate and bird species.
- Enhancement: Species rich amenity grassland in gardens. Erection of bird and bat boxes and bat bricks into the new dwellings.

The expected residual impact with implementation of the above mitigation would be **minor adverse-neutral** upon breeding birds, common invertebrates, reptiles and terrestrial mammals and **neutral** upon foraging/commuting bats, water vole, otter and white-clawed crayfish.

This report aims to establish an ecological baseline, identifying protected habitats and species that may be affected as a result of the proposed works. It aims to establish if further surveys are required and where possible make recommendations for design options that avoid significant effects on important ecological features and resources. The survey and assessment were completed by independent, qualified and experienced ecologists at an optimal time of year in ideal weather conditions.

Our assessment found the application site interior to be of low ecological value typical of species poor improved grassland, the trees and hedgerow habitats surrounding the site and block of moderate ecological value providing nesting opportunities for birds, habitat for invertebrates and small mammals and habitats of value for foraging and commuting bats.

The proposed site redevelopment will be within the footprint of the existing building and with residential garden areas and it is assumed for the purpose of this assessment that there will be no loss of the adjacent boundary and woodland trees and hedging and that the key valuable boundary habitats within and bordering the site are retained and protected during the proposed development. We suggest that any habitat loss associated with the proposal can be adequately mitigated through landscaping, planting and other biodiversity enhancement measures.

The buildings on site were also assessed for the likelihood of bat roosting potential. The buildings were assessed as having **Low** roosting potential and a single dusk emergence survey was carried out, no emergence was recorded and a negative roost assessment can be confirmed.

PRIOR TO COMMENCEMENT: COMPLIANCE WITH ECOLOGICAL REPORT RECOMMENDATIONS

“All ecological mitigation and enhancement measures and/or works shall be carried out in accordance with the details contained within the report (Eco-Check, August 2022), as submitted with the planning application and agreed with the local planning authority prior to determination.”

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.

“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.

Table 1.0 – Executive summary

Protected Species / Habitat	Findings	Potential Effect	Recommended Mitigation, Enhancements & Further survey requirements.
Statutory Protected Site (SSSI, RAMSAR etc...)	none	N/A	N/A
Non-statutory Protected Sites (RSPB, LWS etc...)	none	None	N/A
Protected/ Priority Habitats	None	N/A	N/A
Amphibians (Including Great Crested Newt)	Little suitable habitat on site. Historic mitigation records. Significant barriers to dispersal	No predicted impacts. 5 ponds within 250m	Maintain grassland at a short height across the construction area. Precautionary approach to clearance of any stored materials which may be used as refugia/hibernacula.
Badgers	No evidence found on site. No records.	No predicted impact	Precautionary approach to ground works
Bats	Some roosting opportunities within boundary hedging and trees.	No predicted impacts subject to retaining mature trees with potential bat roost features. Artificial lighting could impede bats from foraging along the woodland boundary.	Prior to any arboricultural works a detailed tree roost assessment to be undertaken. Artificial lighting should be kept to the minimum required for safety. Use of anti-pollution LED bollard lighting and avoid floodlights and security lights where possible.
Birds	Hedgerows and trees provide habitat for nesting birds.	Loss of breeding and nesting habitat. Loss of foraging habitat within site.	Additional bird boxes to be added to buildings. Works to avoid bird nesting season 1 st March to 31 st August.
Reptiles	Site had a large woodpile	Risk of injuring / killing reptiles during development works.	Management of on-site habitats and new habitat creation for reptile species.

1. Introduction

1.1 Background

Eco-Check was commissioned in May 2022 by Mark Collins to undertake an ecological survey of a site on land at 143 Corby Road, Weldon. The site is centred grid reference SP91738954. An ecological walkover survey was conducted on 24th June 2022 to assess the ecological value of the site and the likely presence/absence of any protected species and provide recommendations for further investigations where necessary.

The purpose of the survey was to carry out a preliminary ecological appraisal, habitat and protected species scoping and a preliminary bat roost assessment and review the potential for the site to contain, or be used by, species protected under both UK and European nature conservation legislation, namely The Wildlife & Countryside Act (1981) (as amended) and the Species and Habitats Regulations 2017.

This report details the findings of the survey work and subsequent assessment. Methodologies employed are described including site surveys and evaluation. Recommended mitigation measures and the need for any further survey work are included as appropriate.

1.2 Site Description

The application site is a plot of land located to the north of Corby Road, approximately 0.9km west of the town of Weldon rough grassland and amenity grassland. Connectivity to the wider countryside was via hedgerows and a block of semi mature woodland to the north, as well as a connecting stream system forming the northern boundary. (See Fig.1).

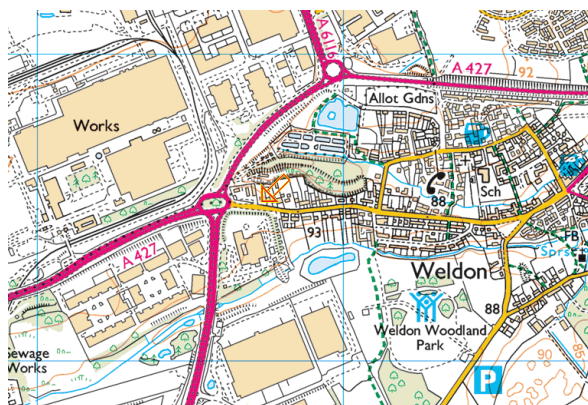


Fig 1.0 Site Location Map – StreetMap, August 2022

The species poor improved grassland garden covers approximately 0.2ha of which the footprint of the proposed access and buildings will be contained within. It is understood that the more valuable boundary trees and hedging will be retained and suitably protected during the development. The surrounding land use is predominantly residential properties and their gardens with scattered trees, hedging and ornamental plants and shrubs. The key habitats, structure, quality and management were assessed to give an assessment of the likely presence of protected or priority species and assess the potential impacts of the demolition works and site clearance. Detailed plans showing the existing and proposed site layout plans are provided in **Appendix 1**.

1.3 Proposed Works

The proposed development is for the demolition of the dwelling and garage and construction of five residential dwellings along with green landscaping and access.

1.4 Scope of Survey

The ecological investigations undertaken include:

1. A desk study to gather existing information on statutory and non-statutory sites of conservation interest, and any protected or notable species.
2. A survey to describe the vegetation and habitats of ecological importance utilizing the Handbook for Phase 1 Habitat Survey, (JNCC, 2010) and the National Vegetation Classification methodology as set out in the NVC Handbook (source: *"Handbook for using the National Vegetation Classification"* J.S.Rodwell, 2006 Joint Nature Conservation Committee).
3. A reconnaissance survey for evidence of protected species and identification of habitats suitable for such species. In particular the survey adopted the national survey methodologies for badgers, birds, reptiles, amphibians, water voles and bats.
4. Analysis of the data gathered from desk and field surveys and identification of any likely significant effects on protected species, including proposals for avoidance, reduction, compensation and enhancement measures.
5. Assessing the magnitude and nature of any impact the existing and proposed land use would make on the site, evaluate any residual effects of the land use and recommendations for further investigations where necessary.

The assessment aims to:

- Describe the baseline condition of the ecological features within the site;
- Assess the potential construction and operational impacts resulting from biophysical changes incurred by the land use;
- Identify the mitigations necessary to reduce the potential impact of the land use on designated sites, habitats, protected and notable species (i.e., ecological features) which occur within the site);
- Summarise the residual impacts of the land use on the ecology and nature conservation in the zone of influence.

The impact assessment presented in this report was undertaken in compliance with the Chartered Institute of Ecology and Environmental Management *Preliminary Ecological Appraisal* (CIEEM, 2018) and *Ecological Impact assessment* (CIEEM, 2016). Comments on the ecological value of the site as a wildlife resource and the significance of the change of land use follow the guidelines provided by Regini (2000).

1.5. Legal Framework

The principal European and UK legislation relating to biodiversity and nature conservation relevant to the proposed development are:

- Conservation of Species and Habitats (Amendment EU Exit) Regulations 2019.
- The EC Directive on the Conservation of Wild Birds (791409/EEC).
- The Wildlife & Countryside Act (1981) and subsequent amendments.
- The CROW Act 2000, particularly Section 74 habitats and species.
- The Protection of Badgers Act (1992).
- Natural Environment and Rural Communities Act 2006
- Hedgerows Regulations 1997

The UK government is committed to a significant reduction of the current rate of biodiversity loss by 2030. This commitment is recognised in:

- The England Biodiversity Strategy
- Biodiversity 2030: A Strategy for England's Wildlife
- National Planning Policy Framework (Replacement of PPS9);
- BS 42020:2013- Code of Practice for Planning and Development

2. Methodology

2.1 Desk Study and Data Consultation

A desk study was undertaken to gather existing ecological records in relation to the site and the surrounding area, in order to provide ecological context for the site and to inform an assessment of the potential ecological constraints to development. A desk study was undertaken using to identify both statutory and non-statutory designated sites for conservation and to identify the presence of priority/protected habitats or species within 2km of the proposed works. In order to compile background information on the site and its immediate surroundings, Northamptonshire Biodiversity Records Centre (NBRC) were contacted, with data requested on the basis of a search radius of 2km. OS maps and aerial photographs were used to identify the presence of features up to 500 m from the site which might be used by protected or notable species.

1:25000 scale maps and local satellite imagery was also reviewed prior to the field survey to identify features of potential interest including ponds, woodland, meadows and adjacent high-quality habitat.

The potential for protected rare and/or priority species to be on site has been assessed considering the nature of the site and the habitat requirement of the species in question. Absence of records does not constitute absence of a species. Habitats on-site may be suitable to support other protected/priority species that have not previously been recorded within the search area.

NBRC do not allow its species records to be made publicly available, such as direct inclusion within this report. Species recorded have been taken into consideration for our impact assessment, however any accurate locations are determined to be sensitive and cannot be revealed.

2.2 Surveyor and Weather Conditions

The field survey was undertaken by James Hodson MSc (Bat Survey License 2017-30927-CLS-CLS, Great Crested Newt Licence 2018-36283-CLS-CLS). The weather was sunny, south-westerly winds of 5mph and approximately 20°C during the survey.

2.3 Phase One Habitat Survey

The site was walked over, and the dominant vegetation and features were noted. Recent aerial photographs (See Fig.3.0) were also consulted. Dominant species notes were taken and the site was documented by a series of photographs (Appendix 2).

The site was inspected for evidence of and its potential to support protected or notable species, especially those listed under the *Conservation of Habitats and Species (Amendment) Regulations 2017*, the *Wildlife & Countryside Act 1981* (as amended), including those given extra protection under the *Natural Environment and Rural Communities (NERC) Act 2006* and *Countryside & Rights of Way (CRoW) Act 2000*, and listed on the UK and local Biodiversity Action Plans. Such species include amphibians, reptiles, bats, badgers, birds, dormice and water voles. Evidence of badgers was searched for throughout the site, including setts, footprints, feeding signs, hairs and droppings. The site was searched for evidence of invasive plant species, such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*),

horizontal/wall cotoneaster (*Cotoneaster horizontalis*) and floating pennywort (*Hydrocotyle ranunculoides*). As the attributes of the site and its potential for protected, notable and invasive species may change over time, this report is broadly considered valid for a duration of two years, after which time it is recommended that an update site assessment is undertaken. In some cases, protected or invasive species' use of a site may change over a shorter timescale, for instance the use of a badger sett by badgers, which may change month to month. In such cases, appropriate precautionary advice or recommendations for update surveys are given within this report. The survey was carried out during the optimal period for the majority of flowering plants (March-August), however early flowering plants may have gone unrecorded

2.4 Protected and Key Species Survey

Amphibians (Including Great Crested Newts)

Any ponds, lakes, reservoirs or other water bodies on site, or within 250M (with good habitat connectivity) were assessed for their potential to support breeding populations of amphibians, specifically Great Crested Newts. Assessing potential suitability for Great Crested Newt is undertaken using the Habitat Suitability Index (HSI), a geometric mean of ten habitat suitability criteria (see table 1.0) (Oldham *et al.* 2000). The resulting HSI score should be interpreted as either; Excellent (>0.8), Good (0.7 – 0.79), Average (0.6 – 0.69), Below Average (0.5 – 0.59) potential for supporting Great Crested Newts (Oldham *et al.* 2000)

Table 2.0 – Habitat suitability criteria used to calculate (HSI), the suitability of a pond to support Great Crested Newts (based on Oldham *et al.* 2000)

Indices	Name:	Description:
Sl ₁	Geographic Location	Lowland England or upland England, Scotland and Wales
Sl ₂	Pond area	To the nearest 50m ²
Sl ₃	Permanence	Number of years pond dry out of ten
Sl ₄	Water quality	Measured by invertebrate diversity
Sl ₅	Shade	Percentage shading of pond edge at least 1m from shore
Sl ₆	Fowl	Level of waterfowl use
Sl ₇	Fish	Level of fish population
Sl ₈	Pond count	Number of ponds within 1km divided by 3.14
Sl ₉	Terrestrial habitat	Quality of surrounding terrestrial habitat
Sl ₁₀	Macrophytes	Percentage extent of macrophyte cover

Badgers

A visual assessment for setts, latrines, prints and evidence of foraging activity was undertaken within the site boundaries.

Bats

A Preliminary Roost Assessment (PRA) was undertaken in accordance with methods outlined in the Bat Conservation Trusts “Bat Surveys for Professional Ecologists” (Collins, 2016) Including both a desk-based and field-based assessment. Details of these guidelines can be found in table 3.0.

Table 3.0 - 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	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.)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.	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. 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.
Medium	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).	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. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	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.	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. 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.

The habitats on and around the site were assessed for their commuting and foraging potential for bats. An evaluation system was applied to the commuting and foraging potential using the following criteria.

- Negligible commuting and foraging potential for bats. Habitat features unlikely to be used by commuting or foraging bats.
- Low commuting and foraging potential for bats. Habitats that could be used by a small number of commuting or foraging bats such as, a gapped hedgerow, non-vegetated stream or lone trees, but are isolated and not well connected to the surrounding landscape.
- Medium commuting and foraging potential for bats. Habitats that are continuous and connected to the wider landscape such as, lines of trees, scrub, linked back gardens, grasslands and water features.
- High commuting and foraging potential for bats. Habitats that are continuous and connected to the wider landscape such as, river valleys and tree lined watercourses, hedgerows, lines of trees, deciduous woodland, and grazed parkland. These habitats are likely to be used regularly by commuting or foraging bats and are likely to be close to, or connected to, known roosts.

Birds

On-site habitats were assessed for their potential to support breeding (nesting) birds. All bird species observed during the two field surveys as well as the reptile survey visits were recorded. Birds observed were categorized based on both their RSPB and BAP status.

Dormice

An initial inspection for evidence of Dormice or habitats that could support Dormice was undertaken.

Invertebrates

Specific sampling for invertebrates falls outside of the remit of a Preliminary Ecological Assessment. However, any invertebrates observed incidentally during the survey were recorded.

Otters, Water voles, and White-Clawed Crayfish.

On-site habitats were assessed for their suitability to support Otters, Water Voles and White-Clawed Crayfish.

Reptiles

All on-site habitats were assessed for their potential to support reptiles, there is no pre-existing refugia such as bricks and wood etc.

Risk Category	Definition
PRESENT	Presence confirmed in the course of current survey or recent, confirmed records.
HIGH	On-site habitat of high quality for a given species/species group. Site within/peripheral to a national or regional population stronghold. Good quality surrounding habitat and good connectivity.
MODERATE	On-site habitat of moderate quality, providing most or all of the known key requirements of a given species/species group. Local returns from the data search, within national distribution, suitable surrounding habitat. Factors limiting the likelihood of occurrence may include small habitat area, habitat severance, disturbance etc.
LOW	On-site habitat of poor to moderate quality for a given species/species group. Few or no returns from data search but presence cannot be discounted on the basis of national distribution, nature of surrounding habitats, habitat fragmentation, recent on-site disturbance etc.
NEGLIGIBLE	While presence cannot be absolutely discounted, the site includes very limited or poor-quality habitat for a particular species or species group. No local returns from a data search, outside or peripheral to known national range for a species, surrounding habitat considered unlikely to support wider populations of a species/species group.
UNKNOWN	Insufficient data to decide of the risk of a species presence or absence.

Table.4.0 Criteria for assessing presence of protected species

2.5 Impact Assessment

The assessment was undertaken in accordance with CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester. In summary the impact assessment process involves:

- Assessing the value of ecological receptors at the site and those nearby that could be affected (e.g. designated sites, habitats, species);
- Identifying the unmitigated impacts of the development (magnitude, spatial extent, duration, timing/frequency, reversibility);
- Providing measures to avoid and mitigate for impacts;
- Assessing the significance of residual impacts after specified mitigation;
- Identifying appropriate compensation measures to offset significant residual effects, and;
- Identifying enhancement opportunities to provide a new benefit for biodiversity.

Value/scale of ecological features:

The value of ecological features uses conservation status (i.e. extent, relative abundance and distribution) to assign geographic levels at which the feature is considered to hold importance.

Ecological features should be evaluated within a defined geographical context (CIEEM, 2016). These are based upon criteria identified in the CIEEM (2016) guidance, which categorise the geographic context of ecological importance as within one of the following:

- International and European;
- National;
- Regional;

- County, or local authority; and,
- Local Importance/Parish (High or Low Value).

Only features deemed “important ecological features” (the term used in CIEEM, 2016) are carried forward into the assessment of potential impacts. Important ecological features are:

- Considered to be sufficiently valuable to the decision-making process; and specifically of “Local Importance (Higher value)” or higher using the geographic frames of reference in Appendix B and,
- Likely to be significantly affected by the project (CIEEM, 2016).

For habitats, this includes the structure and composition of plant communities, the species they may support, and over what distance the habitat may have influence over e.g. wetlands may attract wintering birds from hundreds of miles away, whereas a small block of scrub may only support fauna in the local area

For species, this includes the abundance and distribution within a given geographical area e.g. a small population of great crested newt may be assessed to be of ‘local’ importance in the south of England where populations are abundant but, but of ‘county’ importance in the north of England where the species is scarcer. In depth details of geographic values of importance are summarized in Appendix 4. Ecological features valued at Local Importance (Lower Value) or of negligible value (as per the valuation criteria in Appendix B) are not considered significant features and are scoped out of impact assessment.

It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable (CIEEM, 2016). In some cases, the data collected as part of the scoping process will be sufficient to inform the assessment of effects on a given feature. In other cases, additional surveys will need to be undertaken. Ecological features which are within the zone of influence of a development, but not considered important ecological features, can be ‘scoped out’ (excluded), with justification.

Scale of impact and confidence levels:

Impacts on ecological features can occur either directly (e.g. loss of habitats, habitat fragmentation, noise/light disturbance) or indirectly (e.g. water/air quality, noise and light pollution, recreational disturbance). The overall impact is subjectively assessed taking into consideration a range of factors, including conservation status of an ecological feature, magnitude, spatial extent, duration, timing/frequency and reversibility. Impacts can be both positive and negative. The guidance used to quantify the scale of impacts is provided below;

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 5.0 – Definitions of impact magnitude

The assessment of these impacts is subjective and based on predictions based on the available evidence and therefore may be inaccurate if predicted activities change or scale/extent of the proposed development alters. Therefore, we provide an indication of confidence levels for our assessment using the following criteria:

- Certain probability estimated at above 95%
- Likely probability estimated above 50% but below 95%
- Possible probability estimated at above 5% but below 50%
- Unlikely probability estimated at less than 5%

Consideration is also given to the potential for the development proposal to give rise to significant negative impact in combination with other proposed development in the area, where relevant. An overall assessment of value and predicted impact is provided, and this is based upon the highest level of value of any of the features or species present or likely to be present on the site, and similarly the overall assessment would be the impact of greatest significance.

2.6 Limitations

Desk Study

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

Field Survey

The comprehensiveness 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.

2.7 Legislation

Protected Species

Bats

All bat species are listed under Annex IV (and certain species also under Annex II) of the European Union's Council Directive 92/43/EEC (The Habitats Directive), and are given UK protected status by Schedule 2 of the Conservation of Habitats and Species Regulations 2017. Bats and their roosts also receive protection from disturbance from by the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). This protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

Birds

All bird species are protected under the Wildlife and Countryside Act 1981 as amended. This prevents killing or injuring any bird or damaging or destroying nests and eggs. Certain species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the Wildlife and Countryside Act 1981, which prevents disturbance of the species or its nest and/or eggs at any time with protection by special penalties.

Reptiles

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

Great Crested Newts

The great crested newt (*Triturus cristatus*) is fully protected in accordance with both national and international legislation. The species is listed under Annexes IV and II of European Directive 92/43/EEC, and Schedule 2 of The Conservation of Habitats and Species Regulations 2017. The species is also protected by Sections 9(4) and 9(5) of the Wildlife and Countryside Act 1981 as amended. It is an offence to knowingly or recklessly kill, injure, disturb, handle or sell the animal, and this protection is afforded to all life stages. It is unlawful to deliberately or recklessly damage, destroy, or obstruct the access to any structure or place used for shelter or protection; this includes both the terrestrial and aquatic components of its habitat.

Badger

Badgers (*Meles meles*) are protected under the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended). Under Section 1 of the Protection of Badgers Act 1992, it is a criminal offence, subject to certain mitigating circumstances, to wilfully kill, injure or take a badger, and under Section 3 of this legislation it is a criminal offence, in most circumstances, to destroy, damage or obstruct access a badger sett or part of it. A badger sett is defined in the 1992 Act as any

structure or place that displays signs indicating use by a badger. Although a sett may be empty at a particular time, it may be used as part of a regular cycle throughout the year and can therefore be considered to be in use. Under certain conditions, activities that could otherwise give rise to an offence may be licensed by the Department for Environment, Food and Rural Affairs (Defra) (for agricultural or land drainage purposes) or Natural England (for development covered by planning permission). A sett which can be shown to have been unused for at least a full year is considered to fall outside of the provisions of the 1992 Act. The badger is listed under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), which identifies animals that may not be killed or taken by certain methods.

Statutory Designated Conservation Sites

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

Local Non-statutory Designated Conservation Sites

Local sites of importance to biodiversity, but falling below the criteria for SSSI selection, are designated in Norfolk as County Wildlife Sites (CWS). These sites have no statutory protection but are normally given consideration within local plans.

Species and Habitats of Principal Importance

Other priority species and habitats which are a consideration under the National Planning Policy Framework (NPPF) 2012, placing responsibility on Local Planning Authorities to aim to conserve and enhance biodiversity and to encourage biodiversity in and around developments. There is a general biodiversity duty in the Natural Environment and Rural Communities (NERC) Act 2006 (Section 40) which requires every public body in the exercising of its functions to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. Biodiversity, as covered by the Section 40 duty, includes all biodiversity, not just the Habitats and Species of Principal Importance.

Section 41 of the NERC Act lists several species and habitats as being Species/Habitats of Principal Importance. These are species/habitats in England which had been identified as requiring action under the UK BAP, and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. The protection of either Species of Principal Importance or Habitats of Principal Importance is not statutory, but "specific consideration"¹ should be afforded by Local Planning Authorities when dealing with them in relation to planning and development control. Also, there is an expectation that public bodies would refer to the Section 41 list when complying with the Section 40 duty.

Protected / Noteworthy Species^{3 4}:

A search for protected species was also undertaken using records from NBRC. The species of relevance are summarised as:

Plants

The data search returned several records of protected or notable plant species within the search area. No plants listed on the data search were identified on site. The grassland and other vegetated habitats contained relatively low species richness and therefore unlikely to be of a significant high quality. Overall, the likelihood of the site to contain protected or notable plant species is considered to be **negligible** and this species group is not considered further in this report.

Reptiles

The data search returned no reptile records. The likelihood of reptiles being present on site is **low**.

Invertebrates

66 invertebrate species were recorded in the data search, including those listed as nationally scarce and those listed in Section 41 of the NERC Act (2006). The amenity grassland, and other habitats, contained relatively little species richness and are therefore sub-optimal habitats for invertebrates, the likelihood of the Site to support significant assemblages of invertebrate species is considered to be **negligible** and this species group is not considered further in this report.

Bats

The data search returned records of two species of bat within 5km of the search area. These included: common pipistrelle (*Pipistrellus pipistrellus*) and natterers bat (*Myotis nattereri*) in addition to an unidentified pipistrelle species bat record.

Amphibians

The data search returned no records of amphibians; however, EPS licence returns were returned indicating several mitigation licence applications within 2km. Overall, it is considered unlikely that these populations would utilise the habitats on the Site.

Badger

No records of badger *Meles meles* were returned within the search area, overall, the likelihood of setts being present within the Site is considered to be **low** but cannot be ruled out from being present in the adjacent woodland to the north.

Birds

The data search returned records of numerous protected and notable bird species within the search area. The Site contains suitable breeding bird habitats including scattered trees and hedgerows, woodland and ornamental shrubs. The likelihood of birds to utilise the Site for breeding and nesting

is considered to be **moderate to high**. The likelihood of the Site to support important local assemblages of bird species, or protected and notable bird species, is considered to be **negligible**.

Other mammals

The data search returned no records of hedgehog *Erinaceus europaeus*. The likelihood of hedgehog being present on site is considered to be **moderate**, with the rough grassland, woodland and ruderal habitats providing foraging opportunities for this species.

Pond and waterbodies:

A search for ponds and waterbodies within 250m was conducted using Ordnance Survey Data (OS Explorer Map 237 Scale 1:25,000) and publicly available Environment Agency data:

Five ponds were discovered within a 250m data search however none were accessible at the time of the survey.

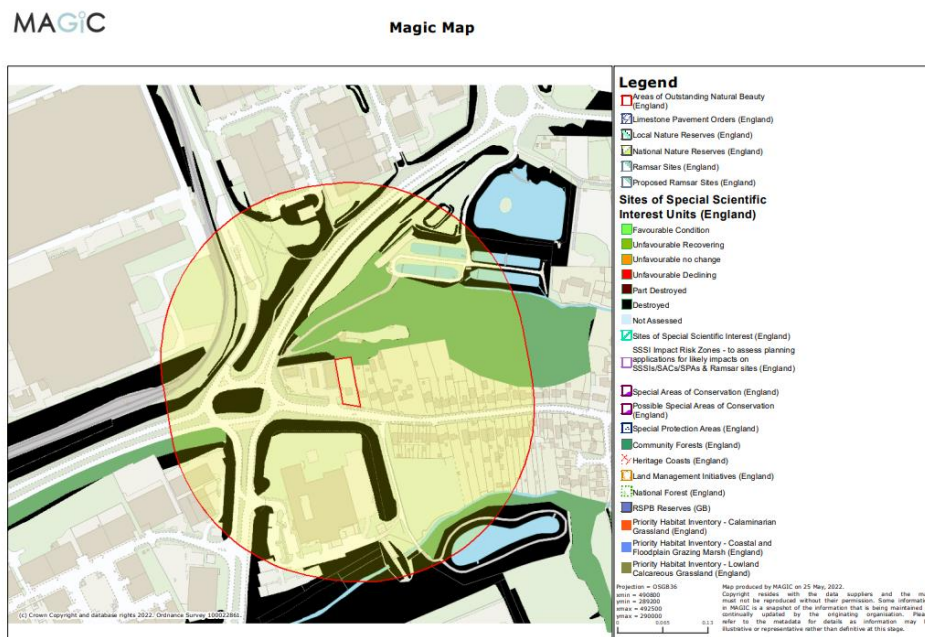


Figure 3.0 Map of ponds within 250m

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 Species and Habitats (Amendment EU Exit) Regulations 2019; 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).

3.2 Phase 1 Habitat Survey

The botanical diversity of the development area is relatively low and comprises amenity grassland, bare ground, buildings, species poor hedges, scattered trees and ornamental plants and shrubs. The following broad habitat types were recorded on or adjacent to the site:

Conditions	24 th June 2022
Temperature (°C)	20
Cloud Cover (%)	15
Precipitation	-
Wind Speed	4 mph SW

Table 6.0- Weather conditions on survey

- Rough amenity grassland
- Species poor hedgerows
- Buildings
- Built up areas

Buildings

Two buildings are present on site. A residential property (B1) of cut stone construction with Redland roof tiles and a detached garage (B2) of similar construction with an asbestos roof lacking sarking.



Figure 4.0 (left) B1 northern elevation and uPVC extension Figure 5.0 (right) detached garage B2

Scattered trees (A3)

The site is bordered by scattered trees and hedgerows as well as several garden specimens that have been planted. The majority of the hedgerows are intact. Tree species include ash (*Fraxinus excelsior*), sycamore (*Acer pseudoplatanus*), walnut (*Juglans regia*), holly (*Ilex aquifolium*), bay laurel (*Laurus nobilis*), leyland cypress (*Leylandii sp.*), apple tree (*Malus domestica*), rowan (*Sorbus aucuparia*), cherry tree (*Prunus avium*), beech tree (*Fagus sylvatica*), monkey puzzle tree (*Araucaria araucana*), Douglas fir (*Pseudotsuga menziesii*) and damson (*Prunus institia*).



Figure 6.0 North woodland boundary and tall ruderal vegetation (left) Figure 7.0 Rank Semi-improved grassland (right)

Built up areas – J3

The site is within a residential setting and is thus bordered by properties to the east and a retail hub to the west. The property sits just north of Corby Road.

Rough amenity grassland-

The majority of the site is rough amenity grassland with several species including: yarrow (*Achillea millefolium*), rye grass (*Lolium perenne*), purple clover (*Trifolium purpureum*), common hogweed (*Heracleum sphondylium*), spear thistle (*Cirsium vulgare*), bindweed (*Convolvulus arvensis*) and nettle (*Urtica dioica*). The southern half of the site has been mown more regularly, leading to a reduction in species diversity.

3.3 Protected Species and Other Species of Nature Conservation

Table 7, below, details the suitability of habitats within the site for key protected species. Species not detailed below are considered unlikely to be significantly impacted by the proposed works.

Species	General Habitat Requirements	Suitable habitat within site	Additional notes (e.g. evidence of species)
Reptiles	Long grass, scattered scrub, hedgerows	Rough grassland	Part of the site is long grass of more suitable habitat. No signs were found and no records of species were returned in the area.
Invertebrates	Species-dependent. High invertebrate diversity is favoured in sites with a mosaic of habitats and diverse plant assemblage.	Scattered trees, rough grassland.	Given the limited size of the site and low diversity of suitable habitats and species, it is unlikely that the site supports any rare or notable invertebrate populations or a diverse invertebrate assemblage.
Nesting birds	Trees, shrubs, scrub, hedgerows, cavities within buildings, waterbodies, arable fields, bare/stony ground.	Scattered trees, access into building through gaps.	The grassland is unsuitable for skylark (<i>Alauda arvensis</i>) and ground nesting birds across the majority of the site due to its low length (under 20-50cm);
Badger	Woodland, dense scrub, meadows, field edges.	Grassland margins	No evidence of badgers was found during the survey, such as setts,

			footprints, latrines, feeding evidence or hairs.
Great crested newts	Breed in ponds and other waterbodies. Terrestrial habitat includes woodland and grassland.	The habitat on site has low potential to support great crested newts in their terrestrial phase.	The suitable terrestrial habitats within the site are restricted to the rough grassland. Site is bordered by residential housing, woodland and roads making the site less likely to be used.
Bats	Roost in buildings, tree cavities and caves.	The mature woodland trees to the north have Moderate roosting potential. The dwelling has low bat roost potential and the garage has negligible potential.	Foraging/roosting habitat on site is suitable for bats.

Table 7.0 – Protected and Priority Species

3.4 Preliminary Tree Roost Assessment-

A search was made of the boundary hedgerow trees and any other notable scattered trees as well as the semi mature woodland on the northern boundary, especially those that are within 15m of the proposed working areas. There are no trees that require removal to facilitate the development. Subject to the protection and retention of the adjacent trees in accordance with BS:5837: 2012- Trees in Relation to Design, Demolition and Construction no further works are required in respect of trees with bat roosting features. In the event that arboricultural works are required then a more detailed inspection of these trees must be first undertaken.

3.5 Great Crested Newt HSI Assessment-

5 ponds were identified within 250m of the site. These were not accessible at the time of the survey. Ponds P2-P5 are all part of the Weldon balancing ponds and are artificially created and of low suitability for newts. 20 licence applications were returned following a search on Magic Maps. The results can be seen below.

3.6 Preliminary Building Roost Assessment-

A search was made of the buildings on site for any evidence of bats roosting or foraging within. Exterior and interior walls were checked for urine staining, oil staining, feeding remains, bat droppings and presence. The bat roost assessment is as follows:

low likelihood due to lack of evidence and quantity of quality roosting locations.

B1 - The residential building is a single storey chalet bungalow of a cut stone construction with a dormer window extending from the south elevation. The roof is redland roof tiles with sarking sheeting underneath and a chimney on the northern elevation. A uPVC conservatory extension is also present on the northern elevation of the building. Overall the building is well pointed with well sealed lead flashing and sealed uPVC around the extensions. The building is deemed to have **low** potential for bats.

B2 –The garage is constructed of cut stone similarly to B1 and has an asbestos sheeting roof and sarking sheeting underneath. The pointing was in good condition and the building is considered to be well sealed. No evidence of bats was noted either internally or externally The building was assessed as having **negligible** potential for bats.

The site was deemed to have **low** potential for roosting bats due to the limited evidence of use found within B1. Buildings with **low** bat potential require a single dusk emergence survey to confirm presence or likely absence. A dusk emergence survey was carried out on the 5th July 2022.

3.7 Bat survey

Bat dusk surveys undertaken at the site were undertaken by wildlife consultant James Hodson and Steve Holland, 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. No bat emergence from either the dwelling or the garage was recorded during the survey. 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 woodland adjacent to the site.

Survey 1- Dusk Survey: 5th July 2022- Surveyors Steve Holland and James Hodson
 Sunset: 21:27 Start Time: 20:45 End Time: 23:10
 Weather Conditions: 14°C, cloudy, dry, 6mph S.W

Time	Species	Location/Comments
21:08	Noctule	Commuting pass
21:41	Noctule	Commuting pass
21:48-21:54	Common pipistrelle	Foraging along woodland edge
21:56	Noctule	Commuting pass
22:16	Noctule	Commuting pass
22:26	Common pipistrelle	Foraging in north garden area
22:34	Noctule	Commuting pass
22:36	Soprano pipistrelle	Commuting across woodland from south to north

Table 8- Dusk emergence survey results summary

4. Evaluation and Recommendations

Sites of National Importance-

Due to the local topography, small scale of the development, surrounding habitats and lack of impact on relevant designated sites, this development proposal is very unlikely to have an adverse effect. The application site is outside of any 'SSSI impact risk zones'.

All internationally designated sites are fully protected by the Conservation of Habitats and Species Regulations 2017. Any new development must avoid having a significant adverse effect on the ecological features for which a SSSI was designated. Any such effect must be considered in combination with potential effects from other developments within influencing distance of the designated site.

The proposal is not considered to be detrimental to any CWS as none are present within 500m of the proposed development and no direct or indirect impact are considered likely. No further survey or mitigation is recommended.

Sites of Regional/Local Importance-

Habitats-

Habitats on site offering some ecological interests are limited to the poor semi-improved grassland and mature trees which are of value to foraging birds, foraging and commuting bats, roosting bats, small mammals and invertebrates.

Overall, the habitats on Site are provisionally assessed as being at the **Lower** value at the **Parish/Neighbourhood scale**. The relatively small scale of the proposed building across species poor grassland of low ecological value means the Impacts are considered to be **Low**. A summary of the ecological significance of the habitats on site is presented below, Table.9

Habitat	Local Ecological Significance	Justification
Rough amenity Grassland	Low	Rough amenity grassland is species poor and annually disturbed reducing its value for wildlife. May provide some foraging habitat for birds and small mammals. Easily replaced habitat.
Scattered trees	Moderate	Trees have Moderate roost potential. Provides food source and refuge for nesting birds, small mammals and invertebrates.

Table 9- Ecological Significance of Habitats

Protected and Notable Species

Please note that all evaluation and recommendations are based upon the findings of this preliminary ecological appraisal and on the proposals 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.

Bats

Roosting bats - trees

Whilst the proposed works are unlikely to have any direct impacts on roosting bats, mitigation has been suggested with regards to providing new bat roosting opportunities such as bat boxes.

The unmitigated impact of the proposed development is provisionally assessed as being **neutral** due to lack of habitats and the low diversity of the existing habitats. This would be improved to **minor-positive** with a sensitive and low level-directional lighting scheme and bat boxes/bricks.

Foraging and commuting bats

The site contains limited habitat for foraging bats across the site interior. There are several mature trees that may provide roosting potential on the north boundary. The broadleaved deciduous woodland adjacent along the northern boundary provides high roosting potential and linear woodland edges, highly suitable for foraging bats.

In order to avoid a detrimental impact on bats using the site, it is recommended that there should be no increased light spillage on to the trees and hedgerows, particularly to the north of the site, where bats are most likely to forage and commute. Lighting should be restricted to the interior of the site and should be kept to a low level. The following measures should be implemented within the lighting scheme:

- Minimise light spill, through use of lighting hoods, and setting the height and angle appropriately.
- Reduce the light intensity to the minimum required for safety and security.
- Set lighting curfews, e.g., lights off at night
- Where security lamps are used these should use a trigger to illuminate them (e.g., infra-red detector), and switch off after a short period, rather than remaining on all night.

The site is assessed as being of value at the **site only** scale for roosting, foraging and commuting bats. The unmitigated impact of the proposed development is provisionally assessed as being **minor adverse-neutral** due to a potential increase in lighting across the site. This would be reduced to **neutral** with the implementation of mitigation including a sensitive lighting scheme as detailed in Section 5.0 and provision of bat boxes and bat bricks.

Birds

The site is adjacent to some trees and hedging and woodland all of which are suitable for nesting birds during the nesting season (1st March to 31st August inclusive). It is recommended therefore

that vegetation clearance works are only undertaken outside the nesting season to avoid destruction of active nests. Vegetation removal may only be undertaken during the nesting season if a careful check by a suitably experienced ecologist can confirm that no active nests are present. If bird nests are present within vegetation to be removed, they must be left *in situ* and not disturbed until all the young have fledged and cease to return to the nest.

Due to the size of the site and low diversity of habitats there is a **Low** risk of important bird assemblages being present. The site is considered to be of value at the **Local/Site** scale for breeding birds. The unmitigated impact of the proposed development is assessed as being **minor adverse** due to the potential loss of suitable nesting/foraging habitat and temporary disturbance during the construction phase. Impacts would be reduced to **minor adverse-neutral** with the mitigation provided in Section 5.0.

Neutral effects are predicted for Schedule 1 bird species, as the habitats expected to be impacted by the development are believed to be unused by these species. Nesting birds are vulnerable to construction impacts including direct destruction of nests and indirect disturbance. Without best practice measures to reduce the risks, minor impacts on local populations of nesting birds would be probable, but not significant.

Great Crested Newts

The application site is of limited value to terrestrial GCN. The grassland provides some connectivity but the small area of suitable habitat and site disturbance indicates that great crested newts are unlikely to be using the site for foraging. The site is within a GCN red zone, however due to the distance from ponds and the significant barriers to dispersal such as industrial and residential buildings, roads, walls, fences etc. The rough grassland on site should be maintained under 100mm to discourage the presence of amphibians and reptiles within the site. The site is considered to be of value at a site only scale for great crested newt. The impact on terrestrial habitats is assessed as being neutral as there will be no loss of valuable habitat to amphibian species or loss of any aquatic habitat.

Reptiles

The managed grassland is of low value to reptile species and there is a Low risk of reptiles being present on site. Reptiles are protected from killing or injury under Schedule 5 (Section 9) and of the Wildlife and Countryside Act 1981 (as amended). Further details of avoidance of injury to reptiles are given in the recommendations below. No further survey for reptiles is deemed necessary, although the boundary vegetation should be kept regularly cut to maintain its unsuitability to reptiles.

The unmitigated impact of the proposed development is considered to be **minor adverse-neutral** due to the potential for loss/disturbance of habitat and the potential for killing and/or injury of reptiles during the clearance phase. This could be reduced to a **neutral** with the implementation of avoidance and mitigation as detailed in Section 5.0 which includes a precautionary approach to site clearance to prevent killing/injury of reptiles.

Badger

No evidence of badgers was found during the survey, such as setts, footprints, latrines, feeding evidence or hairs. The short grassland is of limited value to badgers. The site lacks permanent grassland habitat or woodland and so badgers are unlikely to be present. In the event that any badgers are found during the course of the proposed works, work should be halted immediately, Natural England should be informed and allowed time to advise on the best way to proceed.

Badgers receive specific protection under the Protection of Badgers Act 1992. This means that it is unlawful to knowingly kill, capture, disturb or injure any individual or intentionally damage, destroy or obstruct an area used for breeding, resting, or sheltering badgers. It is possible that badgers could cross the site during works if they are present within the wider area so recommendations as to best practice are given below. There is a Low risk of Badgers being present within the habitats on site. The site is considered to be of **parish** value for badger, subject to sensitive clearance and construction practices the impact is assessed as being **neutral**.

Invertebrates

Due to the common habitats present within the site, it is considered unlikely that the proposed works will significantly impact important populations of invertebrates. Mature trees and hedging on the site may provide some suitable habitat for saproxylic invertebrates, as dead wood is evident in and around the hedgerow trees. The site lacks the required diversity of deadwood to support significant populations of saproxylic invertebrates and is therefore not considered to be of importance to saproxylic invertebrates outwith the zone of immediate influence.

Other habitats within the application area are not considered botanically or structurally diverse enough to support protected or nationally/locally rare invertebrate species and as such are not considered to be of importance to nature conservation outwith the immediate zone of influence.

Due to the common habitats present within the site, it is considered unlikely that the proposed works will significantly impact important populations of invertebrates. The proposed development offers good potential for enhancements, which will benefit invertebrates in the local area. Enhancements such as the planting of native trees and shrubs along the periphery of the new building as well as species-rich wildflower grassland mix would be beneficial to a wide variety of invertebrates.

The site is considered to be of value at a **parish** scale for invertebrates, with a **minor adverse-neutral** impact foreseen due to ground disturbance, vegetation loss and permanent loss of a small area of foraging habitat. The impact would be reduced to **neutral** with implementation of mitigation as recommended in Section 5.0.

Hedgehog and Brown Hare

There is a reasonable likelihood of Hedgehog presence on site. Hedgehogs are protected under Schedule 6 of the Wildlife and Countryside act (as amended) and is listed as a Priority Species under the UK Biodiversity Action Plan. There are no records for brown hare (*Lepus europaeus*) within a 2km radius of the site.

The site is considered to be of **parish** value for terrestrial mammals with the unmitigated impact assessed as **minor adverse** during clearance and construction. Impacts would be reduced to **minor adverse-neutral** with the implementation of mitigation measures as detailed in Section 5.0.

Otter, Water Vole and White-Clawed Crayfish

There is Negligible risk of Otter, Water Vole or White-Clawed Crayfish on site.

Invasive Plant Species: No invasive plant or animal species listed on Schedule 9 of the Wildlife and Countryside Act (1981) (as amended) were recorded on the day of the survey.

Ecological Feature	Scale of Value	Unmitigated Impact	Confidence Level	Residual or Long-Term Impact
Sites of International Importance	International	Neutral	Likely	-
Sites of National Importance	National	Neutral	Likely	-
Sites of Local Importance	District	Neutral	Likely	Neutral
Habitats	Parish	Minor Adverse-Neutral	Likely	Neutral
Green Infrastructure	Parish	Neutral	Likely	Neutral
Reptiles	Parish	Minor Adverse-Neutral	Likely	Neutral
Great Crested Newts	Site Only	Neutral	Likely	Neutral
Rare/Scarce Plant Species	Low	Neutral	Certain	Neutral
Veteran Trees	Negligible	Negligible	Certain	-
Invertebrates	Parish/District	Minor Adverse	Likely	Neutral
Amphibians (excluding GCN)	Negligible	Negligible	Certain	-
Breeding Birds	Parish	Minor Adverse	Likely	Neutral
Wintering Birds	Negligible	Negligible	Certain	-
Aquatic Mammals	Negligible	Negligible	Certain	-
Terrestrial Mammals	Parish	Minor Adverse	Likely	Minor Adverse-Neutral
Roosting Bats	Parish	Neutral	Likely	Minor Positive
Foraging/Commuting Bats	Parish	Minor Adverse	Certain	Minor adverse-Neutral

Table 10.0 – Summary of ecological features, unmitigated impact and residual impact with mitigation

5. Avoidance, Mitigation & Compensation

The development proposals for this site have been considered in terms of the mitigation hierarchy (BSI 2013) ⁵. This consists of a 4-point framework of reference as reproduced below:

Avoidance, mitigation, compensation, and enhancement measures can be secured through planning conditions or obligations.

1. Avoidance should be the primary objective of any proposal.

If protected species are discovered on site either before or during the proposed works, all works should stop a suitably qualified ecologist should be contacted for advice on mitigation before continuing. Requirements below outline how impacts to reptiles, great crested newt, birds and small mammals such as hedgehogs can be avoided.

2. Mitigation measures aim to reduce or remove impacts.

Mitigation for this site should take the form of informed landscape planting and retention of boundary habitats to maintain a corridor for wildlife around and through the site.

3. Compensation is considered to be the last step on the hierarchy

Compensation 'should only be used in exceptional circumstances and as a last resort after all options for avoidance and mitigation have been fully considered' (BSI 2013). No compensation measures are considered necessary for these proposals.

4. Enhancement measures

These aim to provide opportunities for ecological gain as part of a development proposal in line with the NPPF13⁶. Suggestions for enhancement are provided below in Section 9.

⁵ BSI (2013). The British Standard BS 42020:2013 Biodiversity a Code of practice for planning and development

⁶ National Planning Policy Framework (NPPF) July 2021-
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

5.1 Ground Clearance Works-

- As per the recommendations above building demolition, vegetation clearance and tree work across the site should ideally be performed outside of the active bird breeding season 1st March- 31st August inclusive. If this is not possible a bird surveyor should visit the site to check for evidence of nesting birds prior to any clearance works.
- Any artificial and natural refugia within the working areas (brush, grass, sheeting) would be hand-searched for the presence of reptiles and amphibians prior to commencement of works.
- Care should be taken with regards to vegetation clearance and earthworks close to the hedges and hedge bases due to potential disturbance to nesting birds, herpetofauna and small mammals.

5.2 Construction and Working Practices-

- The timing of construction works will be sensitive to nesting birds. If possible, it is proposed that operations within the working area would preferably be started outside of the bird breeding season to minimise the risk of disturbance to breeding birds that have already commenced nesting. Once works commence birds are unlikely to start nesting within the working area. However, in order to avoid accidental harm to nesting birds, a 15m buffer zone will be marked around any nest using high visibility fencing to ensure that the nest is not disturbed, damaged or destroyed whilst in use.
- If any ground nesting birds are found to be nesting within or close to the working areas during the pre-inspection survey or clearance, a 25m standoff from the nest will be marked out and observed, within which no operational activity would be permitted until the breeding attempt had concluded.
- Bird and bat boxes will be erected on the boundary trees and the new building to provide additional nesting and roosting opportunities and to compensate for potential disturbance to nesting birds. There is sufficient off-site habitat for nesting birds.
- In the event that protected species are discovered within the site, works would need to stop until the situation has been further assessed, and if necessary, a mitigation strategy developed and an application made for a site license.
- The site manager and other relevant staff will be briefed (by suitably qualified ecologist) on the possible presence of protected species in the area (Toolbox talk). Staff will be provided with information relating to the legislation which protects species and habitats and briefed on the procedures to prevent disturbance or destruction of individuals or their habitats. Staff will also be briefed on the emergency procedures to be implemented should protected species be found during clearance and construction works.
- Habitats removed, wherever possible will be replaced at the earliest opportunity with native or wildlife attracting species.
- Trenches, pits or holes dug on site that are to be left over night will be covered over or have a ramp placed in them so that any wildlife that falls in can climb out safely;

- The proposed location of the site compounds and any material storage areas will not extend into more important habitats, notably the tree root protection areas RPA's. These key areas should be fenced off with Heras fencing or similar to prevent direct habitat disturbance.
- Care should also be taken if lighting any bonfires as these may be potential hedgehog refugia/hibernation sites. Any brash and log piles on site will be searched by hand before removal/burning (see above) and if discovered translocated to a suitable location.

5.3 Lighting-

- Any new external lights will be set on a motion detector and positioned in such a way that they do not shine on the adjacent hedgerows. Low intensity lighting will 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);

5.4 Tree Works-

- All middle aged and mature trees where possible to be retained and protected in line with British Standard: 5837:2012 “Trees in Relation to Design, Demolition and Construction”
- If tree removal is scheduled between the months of 1st March and 31st August inclusive then a breeding/nesting bird survey should be first undertaken by the ECoW.
- A search of any tree holes, cavities, flaking bark and dense creeping ivy will be undertaken to confirm the absence of any roosting bats, this is particularly important during the summer months when such features are used more frequently.
- In the event that any active nests are identified, no operational activity will be permitted within the stand-off zones until the breeding attempt had concluded.

5.5 Pollution Control-

Standard pollution prevention measures will be put in place including measures such as preventing dust by damping down bare ground and ensuring fuel is stored in bunded tanks. The Environment Agency PPG1 and PPG6 guidance on *General Guide to the Prevention of Pollution and Working at Construction and Demolition Sites* will be adhered to throughout the construction of the Proposed Development.

Liquid-

Many of the materials used in construction operations, such as oil, chemicals, cement, lime, cleaning materials and paint have the potential to cause serious pollution. All fuel, oil and chemical storage must be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of an adequate capacity.

Leaking or empty oil drums must be removed from the site immediately and disposed of via a licensed waste disposal contractor. The contents of any tank are to be clearly marked on the tank, and a notice displayed requiring that valves and trigger guns be locked when not in use. Concrete is highly alkaline and corrosive and can have a serious impact on groundwater, soil and watercourses. It is essential to take particular care with all works involving concrete and cement. Suitable provision is to be made for the washing out of concrete mixing plant or ready-mix concrete lorries so that washings do not flow into any drains or watercourse or seep underground.

Air, Noise and Vibration-

Contractors will be expected to take measures to minimize the presence of air borne dust during clearance and construction. If possible, any activities producing in excess of 70db should be avoided during the bird nesting season.

6. Biodiversity Enhancement

The Natural Environment and Rural Communities Act 2006 (NERC) came into force on 1st October 2006. Under section 40 of the Act all public bodies have a duty to conserve biodiversity:

- “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.”

Section 40(3) of the Act explains that:

- “Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat”.

The duty applies to all local authorities and extends beyond just conserving what is already there to carrying out, supporting and requiring actions that may also restore or enhance biodiversity. This section sets out some measures which the developer should incorporate within the proposals to help maintain and improve the ecological value of the site generally during and after the proposed development.

6.1 Habitat Supplementation-

6.1.1 Birds – To increase nesting opportunities generally, 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 cover a range of species and could include;

- 1 x Eco-Roost (32mm)
- 1 x Eco-Roost (28mm)
- 1 x Eco-Roost wren roundhouse box
- 1 x Eco-Roost house sparrow box

6.1.2 Bats- At present the availability of bat roosts within the site is low as the site has **low** likelihood of bats. The combination of trees, hedges and grassland are valuable to foraging and commuting bats. As a biodiversity enhancement and to compensate for the potential disturbance, areas for bats to roost in should be created and could include;

- 1 x Eco-Roost Double chamber Kent Box
- 1 x Eco-Roost Kent Boxes bat boxes
- 2 x Eco-Roost Bat brick

These boxes are to be installed on the newly erected buildings, ideally one on each elevation to provide the best variation in temperature, shelter and flight lines. If only one elevation is used this should be south-east facing as this provides the most shelter and warmth.

6.1.3 Plant native broad-leaved trees. Suggested species include; blackthorn (*Prunus spinosa*), crab apple (*Malus sylvestris sens.str*), elder (*Sambucus nigra*), field maple (*Acer campestre*), guelder rose (*Viburnum opulus*), hawthorn, honeysuckle (*Lonicera periclymenum*), holly (*Ilex aquifolium*) and English oak (*Quercus robur*) could be used to provide known benefit to wildlife.

6.1.4 Boundary hedging will be planted between October and April when the ground is moist and free from frost, set out in a staggered pattern in two rows 40cms apart. The native species will consist of 50% Hawthorn (*Crataegus monogyna*) with a mixture of at least five of the following species: - Blackthorn (*Prunus spinose*), Field Maple (*Acer Campestre*), Hazel (*Corylus Avellana*), Hornbeam (*Carpinus Betulus*), Holly (*Ilex aquafolium*), Dogwood (*Cornus Sanguinea*) and Guelder Rose (*Viburnum opulus*), See Table 14.

The hedgerow shrubs will be planted as a mixture, but with the supplementary species (Guelder Rose, Spindle and Dog Wood) distributed in groups of 3 or 4 ensuring that the plants are incorporated into both rows and not in a single line within one row. The hedgerow shrubs will be individually protected by 0.6 m Tubex wide mouthed shrub guards supported by a 0.75 m pressure treated softwood stake, or by 0.6m spiral guards supported by a cane. The hedges will be maintained until fully established with losses replaced annually, and then managed by biennial flailing to achieve the characteristic low box profile shape.

PLANTING SCHEDULE				
HEDGEROW MIX (As necessary)				
SPECIES	DENSITY	AGE	ROOT	HEIGHT
10% Blackthorn (<i>Prunus spinosa</i>)	0.45m	1+1 or 1/1	BR	40-60cm
50% Hawthorn (<i>Crataegus monogyna</i>)	0.45m	1+1 or 1/1	BR	40-60cm
10% Guelder Rose (<i>Viburnum opulus</i>)	0.45m	1+1 or 1/1	BR	40-60cm
10% Dog Rose (<i>Rosa Canina</i>)	0.45m	1+1 or 1/1	BR	20-30cm
5% Dog Wood (<i>Cornus sanguinea</i>)	0.45m	1+1 or 1/1	BR	20-30cm
5% Holly (<i>Ilex aquifolium</i>)	0.45m	1+1 or 1/1	CG-3l	40-60cm
10% Hazel (<i>Corylus avellana</i>)	0.45m	1+1 or 1/1	BR	40-60cm

Table 11.0 - Proposed Hedgerow Planting Mix

6.1.5 To provide a shelter for small mammals and herpetofauna an artificial refugia/hibernaculum to be created in the top north of the site, adjacent to the broadleaved woodland. This will also serve as a receptor site in the event any wildlife needs relocating away from the working areas.

6.1.6 Areas of bare soil and disturbed ground to be seeded with a species rich wildflower grass seed mix such as Emorsgate EM-4 or WFG20 species rich amenity grass. This would make a positive contribution towards a biodiversity net gain as the existing grassland is predominantly rye grass.

7. Ecological Conditions and Recommendations for Further Surveys

We suggest that any habitat loss associated with the proposal can be adequately mitigated through landscaping, planting and other biodiversity enhancement measures. The following advisory recommendations include:

- Destruction of in-use nests or harm to adult birds caused by removal of trees/hedgerows on site during the main breeding bird season (1st March to 31st August). If works commence during this period a nesting bird survey must first be undertaken by an appointed ecological clerk of works (ECoW).
- We advise that before the commencement of construction, it is recommended that in line with the British Standard 42020:2013 Biodiversity – Code of practice for planning and development - that a **Biodiversity Enhancement Plan (BEP)** is submitted and approved. The role of the BEP is to ensure that the identified risks to biodiversity are assessed and that suitable methods are adopted on site to minimise the risks through the production of a method statement. The BEP is also to ensure that biodiversity protection zones are enforced.
- Site Clearance- The site contains some rough grassland and some suitable refuge/hibernacula for amphibians and reptiles. It is recommended that clearance of the site is undertaken under the supervision of an ecological clerk of works ECoW.

The suggested condition below is based on BS42020:2013 and in terms of biodiversity net gain, the enhancements proposed will contribute to this aim. Recommended condition:

PRIOR TO COMMENCEMENT: COMPLIANCE WITH ECOLOGICAL REPORT RECOMMENDATIONS

“All ecological mitigation and enhancement measures and/or works shall be carried out in accordance with the details contained within the report (Eco-Check, August 2022), as submitted with the planning application and agreed with the local planning authority prior to determination.”

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.

“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.

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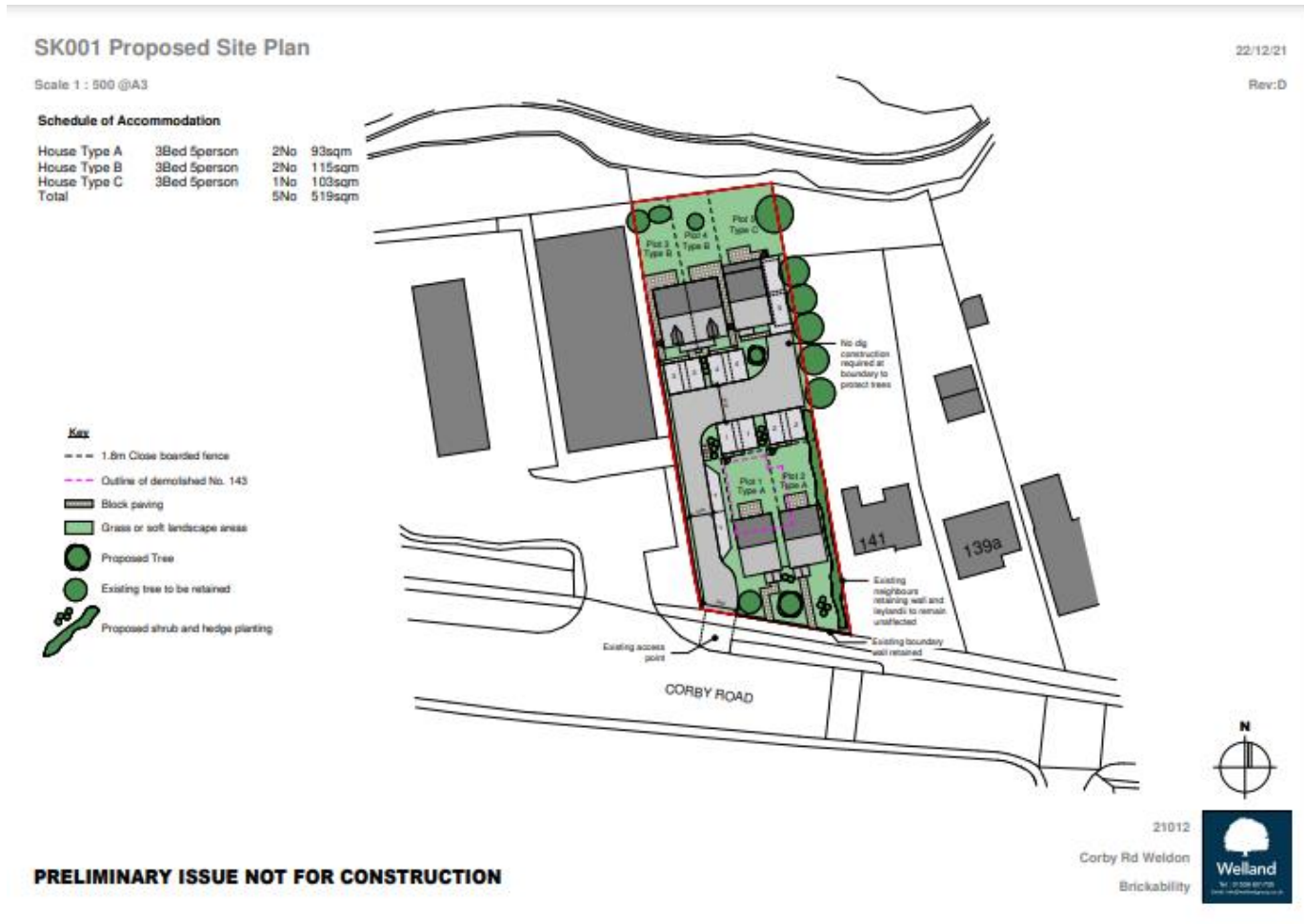
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APPENDIX 1



Site Location Plan



Aerial View of Site, hedgerows and trees and surrounding landscape, as well as building location – Google Maps, August 2022

APPENDIX 2



View from access on Corby Road (left) Garden and amenity grassland (right)



Northern elevation of B1 and conservatory (left) (right) southern boundary garden

Appendix 3

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

<p>County/ Metropolitan</p>	<ul style="list-style-type: none"> ● 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).
<p>● District/Borough</p>	<ul style="list-style-type: none"> ● 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).
<p>Parish/Neighbourhood</p>	<p>Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or Neighbourhood, e.g. species-rich hedgerows.</p> <p>Valuable biological features within Local Nature Reserves selected on Parish ecological criteria.</p>

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

		Licence required?	J	F	M	A	M	J	J	A	S	O	N	D
Habitats / vegetation	Surveys	N	Mosses and lichens. No other detailed plant surveys – Phase 1 surveys only (least suitable time)			Detailed habitat assessment surveys Surveys for higher plants and ferns Mosses and lichens in April, May and September only						Mosses and lichens. No other detailed plant surveys – Phase 1 surveys only (least suitable time)		
	Mitigation	N	Planting and translocation		No mitigation for majority of species						Planting and translocation			
Birds	Surveys	N	Winter birds		Breeding birds / migrant species			Breeding birds		Breeding birds / migrant species			Winter birds	
	Mitigation	N	Clearance works may be conducted at this time, but must stop immediately if any nesting birds are found		No clearance or construction works Bird nesting season						Clearance works may be conducted at this time, but must stop immediately if any nesting birds are found			
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					
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	

¹ 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	
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) ¹ 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?

- 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.
- Care should be taken to prevent the introduction or spread of invasive plants such as Japanese Knotweed or Giant Hogweed.
- 'Keep out wildlife exclusion zone' signs to be secured to barriers.



Trees and Hedgerows

- The contractor should follow the specific requirements of the Local Authority in relation to Tree Preservation Orders.
- 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.



Phased Clearance In Relation to Reptiles and Amphibians

- Any site clearance should be undertaken in a phased and controlled manner and under ecological supervision. This gives a chance to reptiles and amphibians to move out the way to somewhere safe before a site is cleared.
- All clearance work should be undertaken during April - August in order to coincide with the reptile and amphibian active seasonal period and should be undertaken within a temperature range of 16°C - 24°C.
- Stalk grass to a height of 100mm and the cut material to be hand raked to the sides of the area. All strimming should commence in the centre of the site working outwards towards the periphery of the development footprint to where the habitat is to be retained.

Wildlife & Construction Best Practice Guidance



Protected Species

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 nests area should be put up by an ecologist.
- **DO NOT** undertake scrub clearance during the bird-nesting season (March - end of July) if at all possible.
- **DO NOT** undertake scrub clearance during the bird-nesting season without an experienced ecological being present.

Reptiles

- Reptiles are protected, which makes it an offence to intentionally and recklessly kill, injure or take any species of reptile.

Where are they found?

- Grass snake, slow worm and common lizard 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.

What to do if you find a reptile?

- **STOP!** If you think you have found a reptile on site, stop all works and consult an ecologist immediately.

Amphibians

- Amphibian species include the common toad, common frog, smooth (or common) newt and palmate newt, there is also the fully protected great crested newt.

- Common amphibians are protected, which makes it an offence to intentionally and recklessly kill, injure or take them. Great crested newts are further protected for disturbance and/or damaging or obstructing their habitats.

Where are they found?

- 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 and are unsure of the identity?

- **STOP!** and consult an ecologist immediately.
- **STOP!** if you think you have found a great crested nest on site and consult an ecologist immediately.

Bats and their Roosts

- All bat species and their roosts are protected. It is an offence to intentionally kill, injure or take a bat. It is also an offence to intentionally or recklessly damage, destroy or obstruct access to any place that a bat uses for shelter or protection (even if bats are not currently present).

Places you may find them?

- Holes, and cracks in trees, in roofs and walls of houses and buildings, under bridges, in underground caves or old railway tunnels. Every building and mature tree is a potential bat roost.

Things to look out for?

- Below bat roost entrances: Dark stains on walls, tree trunks or bat droppings on the ground.
- Bat droppings are dark brown or black and about half a centimetre long - they crumble when crushed.

What should you do if you think you have found a bat roost?

- **STOP!** all works in the area and contact an Ecologist immediately.



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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.



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Artificial lighting and wildlife

Interim Guidance: Recommendations to help minimise the impact artificial lighting

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

Overview of impacts

Invertebrates

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

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

Birds

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

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

² As above

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

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

Mammals

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

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

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

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

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

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

Recommendations

Survey and Planning

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

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

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

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

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

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

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

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

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

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

Principles and design considerations

Do not

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

Avoid

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

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

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

Do

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

Technological specifications

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

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

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

Further reading:

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

For more information on lighting and wildlife see:

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

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		<p>The 1FF bat box can be sited in trees or on buildings. Size: 43cm high x 27cm wide x 14cm deep.</p>
Schwegler 2F Bat Box		<p>The 2F bat box can be sited in trees or on buildings. Size: 33cm high x 16cm diameter.</p>
1FQ Schwegler Bat Roost (For External Walls)		<p>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.</p>
Improved Roost-Maternity Bat Box		<p>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.</p>
Timber Double Chamber Bat Box		<p>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.</p>
The Kent Bat Box		<p>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.</p>

Bird Nesting Habitat

CedarPlus Nest Box

Available with 2 entrance hole sizes:

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

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

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



Schwegler 1B Bird Box

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

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

Entrance hole sizes:

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

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

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

Height: 23cm; Diameter: 16cm



No. 10 Schwegler Swallow Nest

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

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

