Preliminary Ecological Appraisal and Bat Roost Assessment

Rhos Street School, Rhos Street, Ruthin, LL15 1DU

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

Report produced by:	Produced for:
Eco-Check Consultancy Ltd, White House Cottage Knapton Green North Walsham Norfolk NR28 0RU	Medra
Tel.01263 722199 Mob.07914 130493	
ecocheckconsultancy@gmail.com	

Author:	Date	Reviewed by	Date
James Hodson	04/01/2022	John G Gibson	25/01/2022

CONTENTS

NON-TECHNICAL SUMMARY

Eco Check Ltd were commissioned by Medra to undertake a preliminary ecological appraisal (PEA) and preliminary bat roost assessment (PRA) of the habitats and former school buildings that are within the proposed development boundary. Eco-Check were commissioned to assess the ecological impacts from the proposed demolition of existing buildings and construction of 20 semi-detached dwellings with private gardens and green open space provisions as outlined in the attached drawings in Appendix 1.

This survey aims to highlight any evidence of (or potential for) protected species or habitats that could result in a constraint to the proposed development. The assessment follows guidelines produced by the Chartered Institute of Ecology and Environmental Management (CIEEM 2017) and produces in accordance to The British Standard BS 42020:2013, Biodiversity a Code of Practice for Planning and Development (BSI 2013). To provide information to support the ecological assessment, a preliminary bat roost assessment of the buildings has also been undertaken.

The objectives of the appraisal were to; identify the habitats and species present or potentially present and evaluate their importance, assess the impact of the development proposal and describe any measures necessary to avoid impacts, reduce impacts or compensate for impacts so that there is no net harm to ecological features. The survey involved classifying and recording habitat types and features of ecological interest and identified the potential for protected species to be present by assessing habitat suitability for those species. The survey was undertaken by appropriately qualified and experienced personnel.

A preliminary ecological appraisal and bat roost assessment was conducted by James Hodson BSc, MSc (Natural England, Level 2 Bat Survey License 2017-30927-CLS-CLS) of Eco-Check Ltd on 16th December 2021. An inspection was made of the proposed construction area and surroundings for evidence of or potential to support protected or priority species. Similarly, a preliminary bat roost assessment of the buildings was also undertaken.

Habitats: The site is dominated by tarmacadam hard surfaces and buildings. The bordering habitats of trees and hedging are of greater ecological interest and must be retained and protected through the construction process. The site and bordering habitats were inspected for the likely presence of any protected or priority species or habitats. The site is located within a wider landscape that is of low interest for biodiversity and situated in an urban area. The site itself is bordered by dwellings, gardens, scattered trees and playing fields. Within the 2km search area there are no statutory designated sites or priority habitats.

Species: Species most likely to be disturbed by the proposed works include bat and bird species as well as small mammals and common invertebrate species. The site and/or adjoining habitats provide suitable habitat for the following protected species; foraging and commuting bats, roosting bats (buildings), small mammals and nesting birds. The site provides sub-optimal habitat for badger and reptiles and negligible potential for water vole, otter, great crested newt, hazel dormouse and white-clawed crayfish.

The site and surroundings also contain habitat suitable for hedgehogs and other small mammals. No ponds were identified within a 500m radius of the site.

The survey consisted of 2 connected school buildings (A & B) which are of stone construction with slate roofs and all of the windows have been boarded up with a protective mesh. To the east is a detached building (C) which is of brick construction with a felted flat roof and two large roof vents. A

further building (D) is shown on the aerial imagery but the building has been demolished and there remains the building foundations. There is missing and dislodged pointing in both buildings A and B and there are large roof voids which could not all be inspected during the preliminary survey. There are also voids around the eaves, stone wall tops, ride capping and some loose and lifted roof tiles which could provide bat roosting opportunities and access to the roof space. No evidence of any bat roosts was found during the survey apart from some possible feeding remains within the roof space of building B. Both buildings A & B were assessed as having **moderate roost potential.** The detached building C did not appear to have many roosting opportunities apart from some lifting felt roof at eaves level. The building was assessed as having **low roost potential**

In accordance with Bat Surveys-Good Practice Guidelines, J. Collins, 2016 and 'Bat Workers Manual, 3rd Edition, Mitchell and Jones, 2004 buildings with **Moderate** roost potential require one dusk survey and one dawn survey to confirm presence/absence of roosting bats. Building with low roost potential require one dusk survey.

No evidence of nesting birds was found within the buildings; however, evidence of previous passerine bird nesting activity was noted in the bordering trees and shrubs including a wood pigeon *Columba palumbus* nest along the south boundary and a nest of a wren *Troglodytes troglodytes* in a void in the brick wall on the east boundary.

Desk Study: The desk study identified records of 5 bat species, 1 record of great crested newt, 2 records of water vole, 7 records of Hedgehog (UK/Suffolk BAP) have been recorded within the 2km search radius. There are also a number of UK Priority and Red/Amber List Bird Species as well as SoCC (Species of Conservation Concern) including barn owl, little owl, linnet, nightingale, corn bunting, grasshopper warbler, tree sparrow, grey partridge, lesser spotted woodpecker, kingfisher, reed bunting, skylark, spotted flycatcher and yellowhammer.

Impact Assessment: Given the scale of the proposed development (20 dwellings) and lack of any statutory sites within 2km, no direct or indirect impacts to statutory designated sites are anticipated. In the absence of mitigation, the proposed development would give rise to a moderate adverse impact on breeding/nesting birds and a minor adverse on terrestrial mammals and habitats and a minor-adverse-neutral impact on invertebrates and foraging/commuting bats. The impact of the proposed building demolition on roosting bats is currently unknown pending further summer bat surveys during the optimal season of May to August inclusive.

Recommendations: Avoidance, mitigation and compensation measures have been proposed which would reduce the overall impact to minor adverse-neutral, including:

Avoidance: Maintain grassland across the site at a short height to minimise the likely presence of amphibians and reptiles; retention of mature tree specimens and hedging; timing of demolition, vegetation clearance (hedges, bramble stands, trees and shrubs) 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; tree protection measures and methods specified by a suitably qualified arborist are recommended in accordance with BS5837:2012; no groundworks or plant machinery within the RPA's of retained trees; sensitive lighting design in accordance with Bat Conservation Guidelines (2018); 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 for a range of invertebrate and bird species.
Enhancement: Erection of bird and bat boxes, installation of insect hotels, species rich amenity grassland seeding (WFG20), new tree and hedge planting, creation of artificial refugia/hibernaculum

along the edge habitats of the site. A native species rich hedgerow could be planted along the west rear garden boundary of the dwellings (Plots 11-18).

Further Surveys:

The expected residual impact with implementation of the above mitigation would be **minor adverse** upon breeding/nesting birds and foraging/commuting bats, common invertebrates and terrestrial mammals. The impact on badger, reptiles, amphibians, water vole, otter and white clawed-crayfish is considered to be **neutral.** We suggest that any habitat loss associated with the proposal can be adequately mitigated through landscaping, planting and other biodiversity enhancement measures. The overall impact assessment does not take into consideration those species for which further information is required. To fully assess the site for, and the impact of the proposed development upon, protected species, detailed surveys are recommended for the following species:

- Destruction of in-use nests or harm to adult birds caused by demolition of buildings, 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 a suitably qualified ecologist (SQE).

- Preliminary Tree Roost Assessment (PRA)- If semi-mature or mature trees are likely to be impacted upon, i.e., where trees will be removed, root protection zones cannot be adhered to, or management is recommended by the appointed arborist, a Preliminary Tree Roost Assessment of the trees must be undertaken.

- Buildings A and B have moderate bat roosting potential and building C has low roost potential. Further summer dusk and dawn bat emergence and return to roost surveys are required to confirm the presence or absence of roosting bats. Similarly, some of the high roof spaces were not accessible and so a tower is to be provided to undertake a bat survey of these areas.

- An Ecological Constraints and Opportunities Plan (ECOP) would highlight the boundary habitats as a moderate (and ultimately replaceable) constraint on development. Before the start of construction, it is recommended that in line with the British Standard 42020:2013 Biodiversity – Code of practice for planning and development - that a Construction Environment Management Plan (CEMP) is submitted and approved. The role of the CEMP 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 CEMP is also to ensure that biodiversity protection zones are enforced.

1 INTRODUCTION

Eco Check Ltd were commissioned by Medra Housing to undertake a preliminary ecological appraisal (PEA) and preliminary bat roost assessment (PRA) of the habitats and former school buildings that are within the proposed development boundary. Eco-Check were commissioned to assess the ecological impacts from the proposed demolition of existing buildings and construction of 20 dwellings with private gardens and green open space provisions as outlined in the attached drawings in Appendix 1.

This survey aims to highlight any evidence of (or potential for) protected species or habitats that could result in a constraint to the proposed development. The assessment follows guidelines produced by the Chartered Institute of Ecology and Environmental Management (CIEEM 2017) and to British Standard 42020:2013 (BSI, 2013). This report provides recommendations for enhancement of the site for biodiversity in line with the National Planning Policy Framework (NPPF) (Department of Communities and Local Government, 2018) and best practice guidelines.

1.1. Site Location - The application site is located within the market town and community in Denbighshire County, Wales, in the south of the Vale of Clwyd. The site is the former Rhos Street School. The 1.3-acre (0.5 hectares) site in the centre of Ruthin became vacant when Rhos Street School and the Welsh medium Ysgol Pen Barras relocated last year. The site is dominated by tarmacadam hard surfaces and buildings.

The combination of OS maps and Google earth indicate there are no ponds within the site or within a 500m radius. The main access for the site is currently onto Rhos Street on the north boundary. The bordering habitats include buildings, gardens, roads and playing fields **(See Fig 1).**

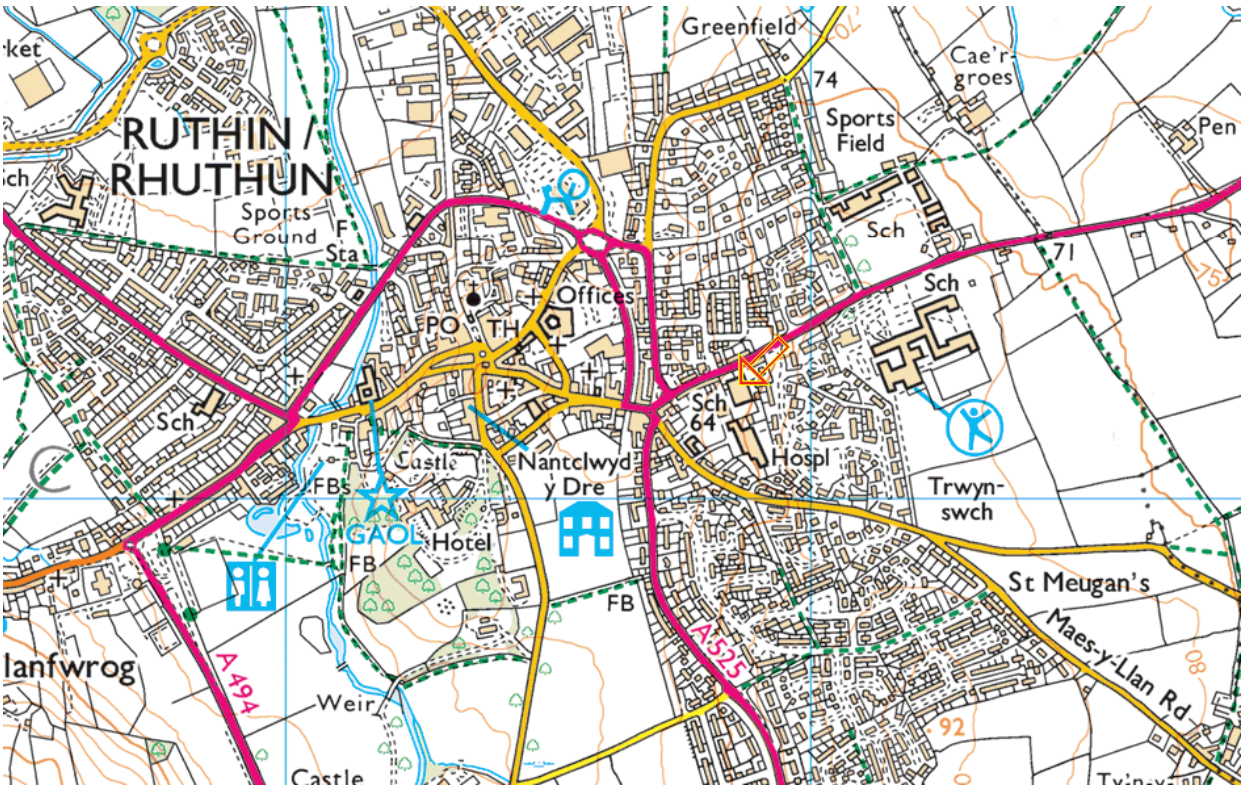

Figure 1. Site Location Map

1.2. Proposed Works

The proposed development is for the demolition of all of the existing buildings and construction of:

- 2 no. 2-bed apartments (Affordable Homes);
- 4 no. 2-bed, semi-detached properties;
- 9 no. 3-bed, semi-detached properties;
- 3 no. 3-bed semi-detached properties (side entry); and
- 2 no. 4-bed, detached properties with integral garages.

For the purposes of the ecological survey, it is assumed that:

• No temporary access points or temporary hard standing areas outside of the defined development area will be used for site access, construction traffic or storage of building materials.

• The development will be contained within the defined boundaries shown in Appendix 1 and will not detrimentally impacts on any habitats outside that defined boundary.

• No ponds or permanent watercourses will be disturbed by the development works.

• There will be no loss of mature or established trees on or surrounding the site

1.3. 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 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), and;
- 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, 2017). 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).

1.4. 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 Natural Environment and Rural Communities (NERC) Act 2006
- 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).
- The Hedgerow Regulations 1997

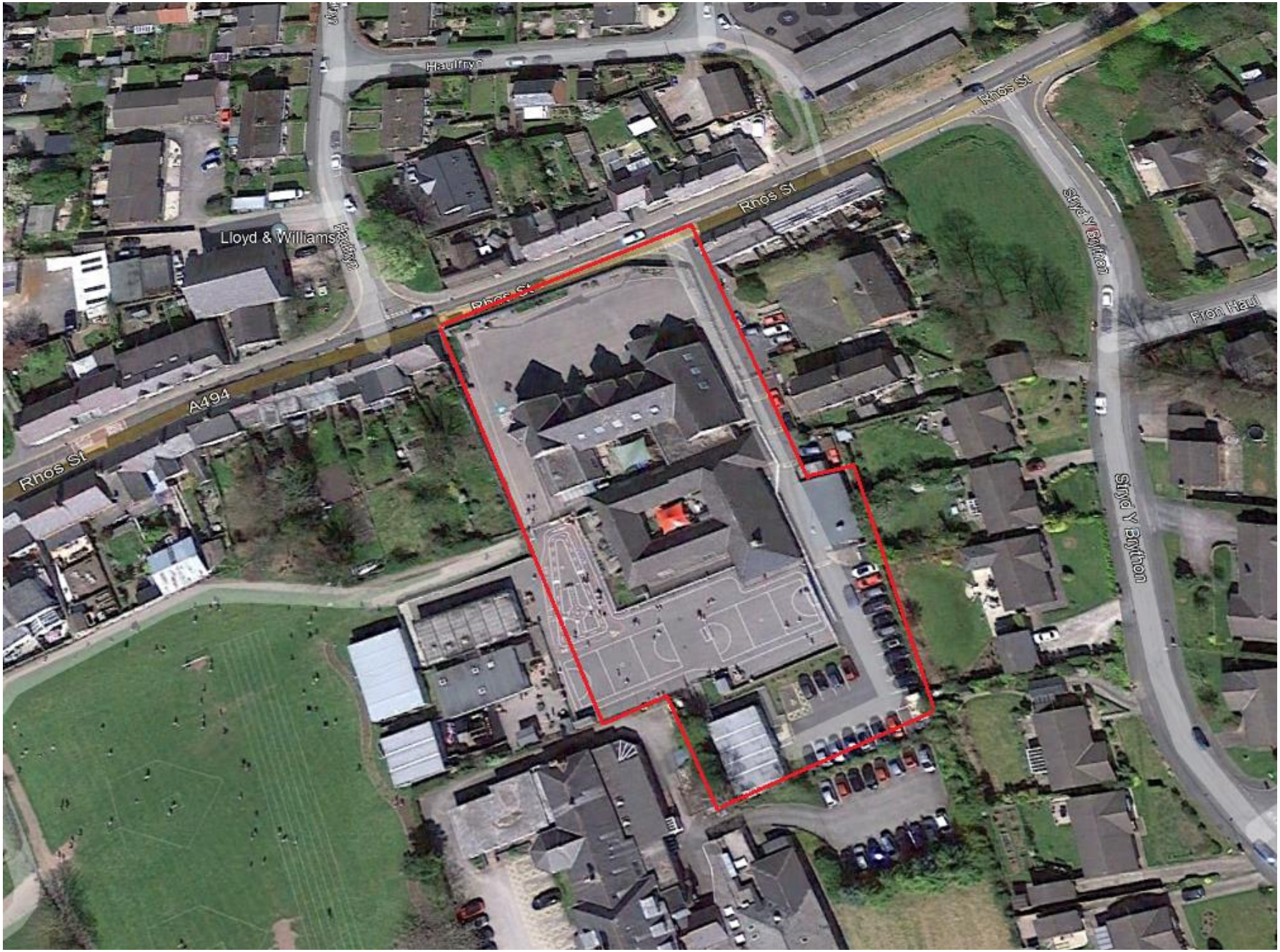

Figure 2. *The site location is indicated by the red outline-. The map highlights the surrounding dwellings, gardens, roads, hospital, grassland, broadleaved tree line, scattered trees, hedgerows and playing fields (Google Earth, April 2015)*

2 RELEVANT LEGISLATION

2.1 Protected Species

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

2.1.2 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.

2.1.3 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 North Wales, 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.

2.1.4 Herpetofauna

Herpetofauna- Native species of herpetofauna are protected solely under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). Species such as the adder *Vipera berus*, grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slowworm *Anguis fragilis* are listed in respect to Section 9(1) & (5).

2.1.5 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 Conservation of Species and Habitats (Amendment EU Exit) Regulations 2019. The species is also protected by Sections 9(4) and 9(5) of the Wildlife and Countryside Act 1981 as amended. It is an offence to knowingly or recklessly kill, injure, disturb, handle or sell the animal, and this protection is afforded to all life stages. It is unlawful to deliberately or recklessly damage,

destroy, or obstruct the access to any structure or place used for shelter or protection; this includes both the terrestrial and aquatic components of its habitat.

2.1.6 Badgers

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.

2.1.7 Water Voles and Otters

The water vole and otter are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 and are priority conservation species. It is an offence to:

- intentionally capture, kill or injure water voles or otters
- damage, destroy or block access to their places of shelter or protection (on purpose or by not taking enough care)
- disturb them in a place of shelter or protection (on purpose or by not taking enough care)
- possess, sell, control or transport live or dead water voles or parts of them (not water voles bred in captivity)

2.2 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.

2.3 Local Non-statutory Designated Conservation Sites

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

2.4 Species and Habitats of Principle Importance

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

Section 41 of the NERC Act lists a number of species and habitats as being Species/Habitats of Principal Importance. These are species/habitats in England 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.

3 SURVEY METHODS

3.1. Desk Study

A desk study for statutory and non-statutory wildlife sites and protected and priority species was undertaken using the Magic website and records supplied by the NBN Gateway. 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.

Species recorded have been taken into consideration for our impact assessment, however any accurate locations are determined to be sensitive and cannot be revealed. Natural England's Multi-Agency Geographic Information for the Countryside (MAGIC) database (Natural England, 2020) and the NBN Atlas were accessed on the 22nd December 2021 for information on:

- Natura 2000 sites such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites within 2km of the study area;
- Statutory sites designated for nature conservation within a 2km radius of the study area;
- Natural England's Impact Risk Zones (IRZs) for Sites of Special Scientific Interest (SSSI), Special Areas of Conservation, Special Protection Areas and Ramsar sites within which the study area was located; and
- Any European Protected Species Mitigation Licenses granted by Natural England within a 2km radius of the study area.
- Non-statutory nature conservation designations, such as County Wildlife Sites (CWS);
- Legally protected species, such as great crested newts, reptiles, birds and bats; and
- Notable species, such as those listed in the local Biodiversity Action Plan

3.2. Phase 1 Site Survey

The survey was undertaken on 16th December 2021 by James Hodson MSc (Bat Survey License 2017-30927-CLS-CLS, Great Crested Newt Licence 2018-36283-CLS-CLS). The vegetation and habitat types within the site were noted during the survey in accordance with the categories specified for a Phase 1 Vegetation and Habitat Survey (JNCC, 2010). 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

3.3 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 1.0 – 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:
SI_1	Geographic Location	Lowland England or upland England, Scotland and Wales
SI_2	Pond area	To the nearest 50m²
SI_3	Permanence	Number of years pond dry out of ten
SI_4	Water quality	Measured by invertebrate diversity
SI_5	Shade	Percentage shading of pond edge at least 1m from shore
SI_6	Fowl	Level of waterfowl use
SI_7	Fish	Level of fish population
SI_8	Pond count	Number of ponds within 1km divided by 3.14
SI_9	Terrestrial habitat	Quality of surrounding terrestrial habitat
SI_{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 2.0.

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

Suitability	Description of Roosting habitats.	Description of Commuting and Foraging habitats.
Negligible	Negligible habitat features on-site likely to be used by roosting bats.	Negligible habitat features on-site likely to be used by commuting or foraging bats.
Low	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.

Building Inspection-

Bat surveys usually involve two elements, surveying sites for likely roost and hibernation sites and surveying likely foraging areas. The daytime survey of the site was carried out on the 16th December 2021. The weather conditions were dry, cloudy and cool with a temperature of 10°C. The survey was undertaken in accordance with the Bat Conservation Trust's *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). A thorough methodical inspection of the outside of the buildings was carried out from ground level to eaves level looking for evidence of bats and possible bat access points. An inspection was carried out inside the buildings (where accessible and safe to do so) looking for evidence of bats and bat roosting sites.

In examining the buildings for barn owls, a search was made for evidence of barn owls (feathers, pellets and faecal 'splashes' on timbers), their nest sites and the birds themselves. The buildings were also assessed for potential to support nesting or roosting barn owls and other nesting birds. In examining the buildings for bats, particular attention was given to any gaps in which bats may roost. It is important to remember that bats are difficult to survey and find and it is usually signs of their activity rather than their actual presence that indicates the existence of a bat roosting site. The presence of moth and butterfly wings for example can indicate bat presence. Bat droppings on walls, floors and flat surfaces can be used to identify species.

Floors, walls, supports, and exposed surfaces were inspected for bat droppings, bat urine, feeding remains, oil staining from the fur of bats (indication of frequent use of a particular site), clean cob-web free areas on the ridge boards or crevices and wear of substrates caused by the movement of bats in and out of potential roost exit holes over a long period of time. Beneath ledges, the ground was examined for feathers, pellets and birdlime that could indicate occupation by barn owls.

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.

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 and all any pre-existing refugia including discarded plastics, paving slabs, bricks and wood were carefully examined.

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 make a determination of the risk of a species presence or absence.

Table.3.0 Criteria for assessing presence of protected species

3.4 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, 2018). These are based upon criteria identified in the CIEEM (2018) 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, 2018) 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, 2018).

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.

Ecological features valued at Local Importance (Lower Value) or of negligible value (as per the valuation criteria in Appendix 3) 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, 2018). 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 4.0 – 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 than5%

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.

3.6. Limitations

The extensiveness of the ecological assessment was limited by the season in which the site visit was made. To confirm the presence or absence of all protected species usually requires multiple visits at suitable times of the year. Summer surveys between May and September are considered optimal. The site visit focused on assessing the potential of the site to support species given protection under British or European law. In view of the above constraints this assessment cannot be considered to provide a comprehensive survey of the ecological interest of the site. It does however provide a “snapshot “of the ecological interest present on the day of the visit and highlights areas where further survey work may be required.

It is expected that evidence of bats (particularly in exposed areas or on external faces of the building) which may be present at other times of the year may not have been visible during the survey. A difficulty in inspecting buildings for bats is that the presence of smaller roosts is generally harder to detect than more significant colonies, particularly those of crevice dwelling bats such as pipistrelle. In addition, bats are very transient in nature with complex roosting behaviour and often move between several different roosting sites during the year. Therefore, the presence of transient singleton roosts (e.g., single male roost) can be present at any time of year. Some of the roof spaces were too high to access from a ladder and building C was not accessible to survey inside.

4 RESULTS

4.1 Desk Study

Statutory Designated Sites [1]

There are no statutory designated sites within 2km

Non-Statutory Designated Sites [2]

There is one County Wildlife Site (CWS) within a 2km radius of the proposed development area. CWS are defined in Structure Plans and Local Plans under the Town and Country Planning System and are a material consideration in the determination of planning applications. The site is summarised below in **Table 5.**

SITE NAME	SITE DESIGNATION	APPROXIMATE PROXIMITY
Coed y Galchog	CWS– Ancient Woodland	SJ 1129 5714, 1.35km south-west

Table 5. Non-statutory designated sites within 2 km of the site

Within the 2km search performed by Magic (2021), the following UK Priority habitats have been recorded; broadleaved deciduous woodland. These can be seen in Figure 3, below.

Figure 3. Magic map of surrounding designations and Priority/Protected Species

Protected and Notable Species Records [3] [4]

A 2km data search of the site revealed a total of 555 species records.

Results of note are as follows:

- Bats- 32 records of bats including Natterer's bat *Myotis nattereri*, whiskered bat *Myotis mystacinus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared bat *Plecotus auratus* and lesser horse shoe bat . The majority of the data was collected between 1993 and 2019 at various locations locally.

- Bird species - Protected species of interest include (all are Red listed and UK priority species); cuckoo *Cuculus canorus*, kingfisher *Alcedo atthis,* yellow hammer *Emberiza citronella*, lesser redpoll *Acanthis cabaret,* Song thrush *Turdus philomelos,* Lapwing *Vanellus vanellus,* barn owl *Tyto alba,* goshawk *Accipiter gentilis,* turtle dove *Stretopelia turtur* and Skylark *Alauda arvensis*.

- Mammal species - Protected species of interest include 23 counts of western European hedgehog *Erinaceus europaeus* (2014-2015), 1 record of water vole *Arvicola amphibius* (2005), 3 records of otter *Lutra lutra.*

- A search of the Magic database for Protected Species Licenses returned no records. No reptile or great crested newt records were returned.

- Amphibian species- 1 record of common frog *Rana temporaria.*

Pond and waterbodies:

Establishing the appropriate survey area. Using the current published Natural England 'Great Crested Newt Method Statement for EPS licence application, Instructions, Survey guidance table', the pond search area of 250m was considered appropriate, based upon:

- The scale of the development is classified as minor, 20 properties.
- No ponds will be directly affected by the development.
- Less than 2000m² or 0.2ha of potential Great Crested Newt habitat will be damaged or lost to the development.

A search for ponds and waterbodies within 500m was conducted using Ordnance Survey Data (OS Explorer Map 237 Scale 1:25,000) and publicly available Environment Agency data. No ponds were identified within the search radius however the presence of ornamental garden ponds cannot be excluded.

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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).

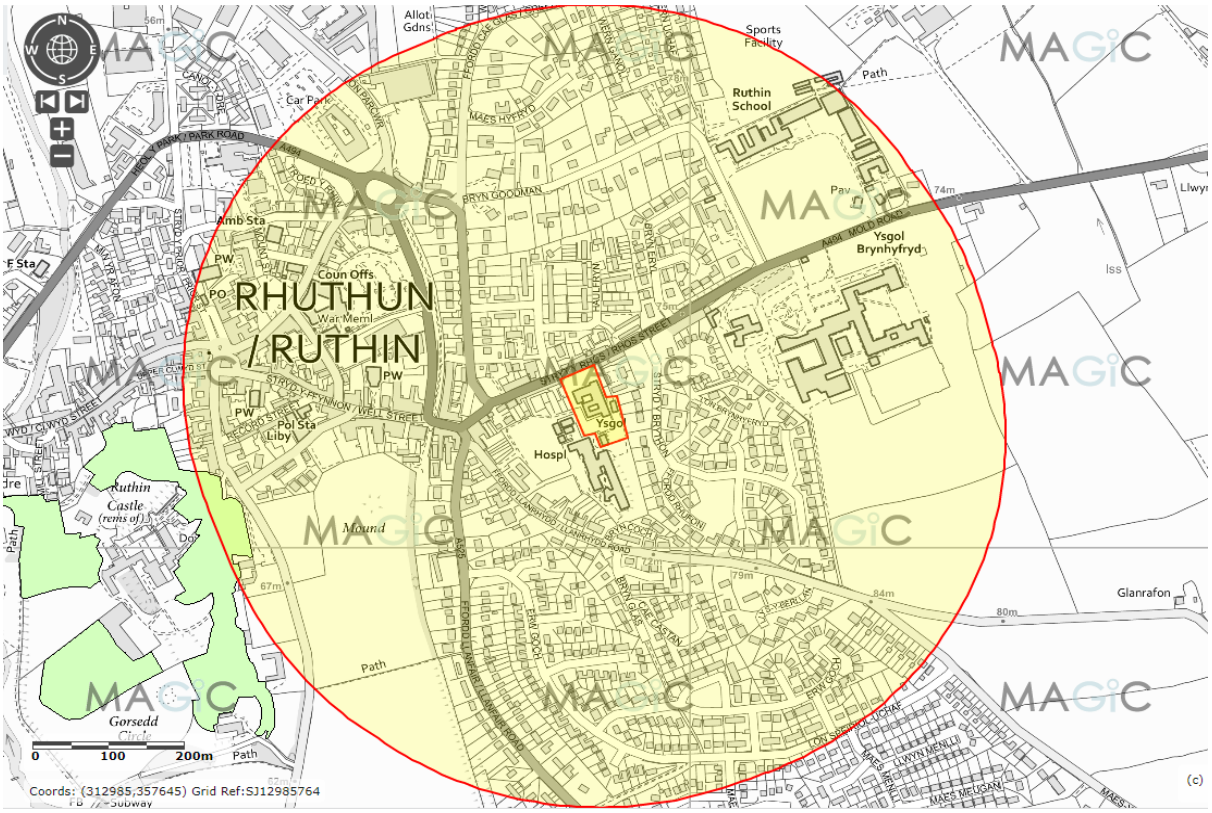

Figure 4. Magic search for ponds within 500m radius of site

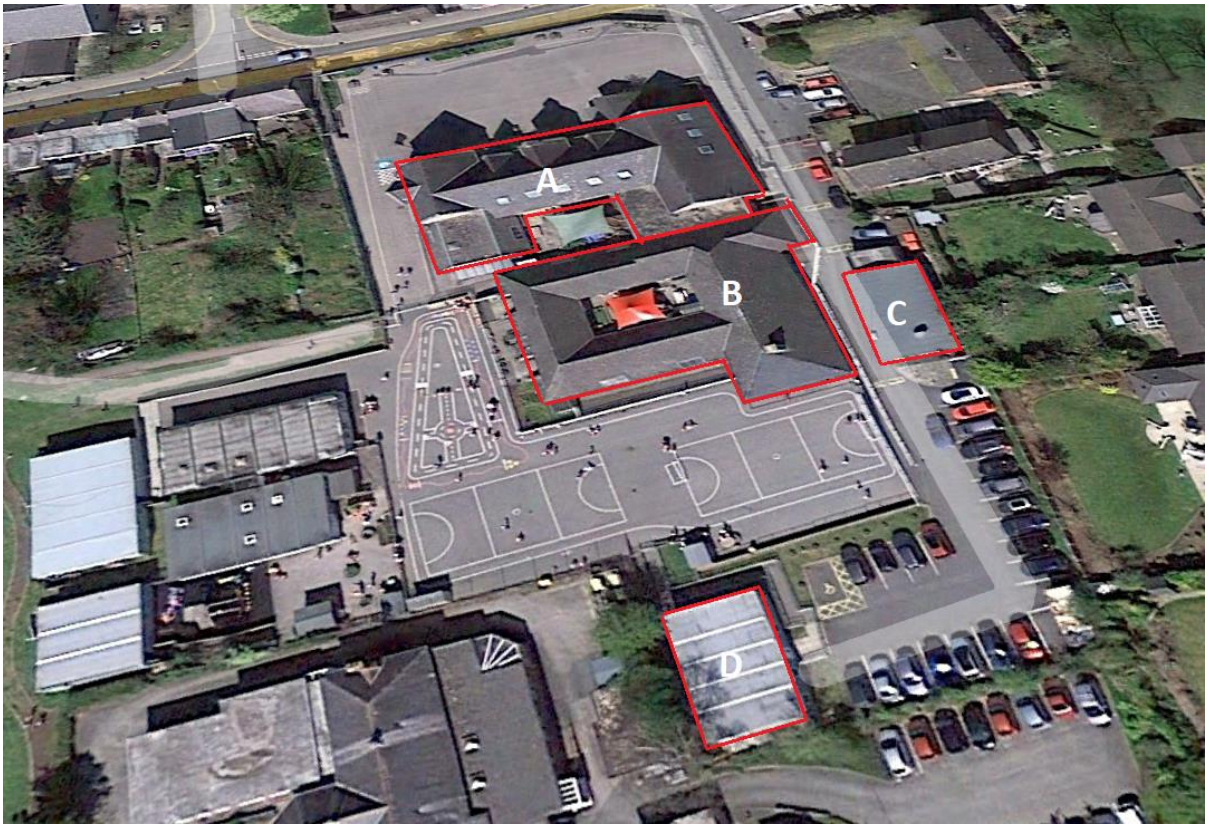

Figure 5. Survey buildings

4.2 Habitat Survey

An inspection was made of the buildings, proposed construction area and surroundings for evidence of or potential to support protected or priority species. Hedgerows, scattered trees, buildings, bare ground, improved grassland and ornamental plants and shrubs are the main habitats within and bordering the site.

4.2.1 Phase 1 Habitat Types-

The botanical diversity of the site interior is of relatively low interest comprising mostly bare ground, hard standings and buildings with small isolated areas of grassland, scattered trees and shrubs. The following broad habitat types were recorded at or adjacent to the site:

- Bare ground- J4
- Buildings- J3.6
- Improved grassland- B4
- Introduced shrubs-J1.4
- Scattered trees- A3.1
- Tall ruderal- C3.1

Tarmacadam hard standings dominate the majority of the land bordering the school buildings and also some disturbed ground and bare soil exposures bordering the buildings. There is a small area of rough grassland off the south-west corner of building B and a narrow grass verge along the east boundary stone wall. The sward height at the time of survey was approximately 10-15cm. The dominant improved grassland species included ryegrass (>50% *Lolium perenne),* creeping buttercup *(Ranunculus repens),* daisy (*Bellis perennis),* dandelion *(Taraxacum officinale),* bristly ox-tongue (*Helminthotheca echioides*), groundsel, creeping thistle (*Cirsium arvense),* nettle (*Urtica dioica),* ribwort plantain *(Plantago lanceolata)* and docks (*Rumex spp*). Flowering plants included purple dead nettle (*Lamium purpurea),* ground ivy (*Glechoma hederacea),* cleavers (*Galium aparine*), field speedwell (*Veronica persica),* herb robert (*Geranium robertium),* Dove's foot cranesbill (*Geranium molle)* and Corn flower (*Centaurea cyanus).*

There are frequent semi-mature and young specimens of hawthorn, sycamore, elder, silver birch and holly trees with creeping ivy and brambles encroaching the south and south-west boundary and beyond the close-boarded fence on the eastern boundary. Introduced shrubs included Cotoneaster, Buddleja and Crocosmias.

Tall ruderal vegetation is also frequent throughout the site, particularly the building edges and along the walls and fences. Species included Nettle *(Urtica dioica)*, ragwort (*Jacobea vulgaris),* cow parsley (*Anthriscus sylvestris),* Canadian fleabane (*Erigeron canadensis),* purple toadflax (*Linaria purpurea),* garlic mustard (*Alliaria petiolate).*

Building A and tarmacadam playground

Building B and tarmacadam playground and path

Rough grassland bordering west side of building B

Improved grassland verge along east boundary wall

Introduced shrubs along boundary walls and fences

Brambles stands, tall ruderals and scattered trees along south and south-west boundaries of the site.

	
Wall speedwell growing on east stone wall	Vegetation removed around south car parking area

Table 6. Pictures highlighting the site habitats

4.3 Protected Species Potential

4.3.1. Birds:

Assessment of the site habitats deemed that the boundary scattered trees, plants and shrubs as well as the open and accessible buildings were of the most ecological value to fauna and a suitable habitat for breeding birds exists in the tree lines, shrubs and stone walls as well as the buildings themselves. Nests were found in the south boundary vegetation which appear to be indicative to Wood pigeon.

House sparrows *Passer domesticus* were seen flying within the site. Evidence of bird nesting were found in the trees and shrubs. Nests were the size and shape indicative of blackbird *Turdus merula* and wood pigeon *Columba palumbus*. During our survey the surveyor noted seven species of bird present during the visit; Robin *Erithacus rubecula,* blue tit *Cyanistes caeruleus,* great tit *Parus major*, Wren *Troglodytes troglodytes*, wood pigeon *Columba palumbus*, house sparrow *Passer domesticus* and blackbird *Turdus merula*.

Owls- No barn owl nesting sites were found in any of the buildings or evidence that they were using the buildings for any purpose. From the buildings were inaccessible to barn owls. The buildings are generally well sealed and inaccessible to birds and as such have low potential for nesting birds.

4.3.2. Bats:

The desk study identified 31 records of 5 bat species. No specific records of bats within or adjacent to the site were returned from the desktop study. All species of bat are protected under the EC Habitats Directive (1992), as implemented by the Habitats and Species (Amendment EU Exit) Regulations 2019. These regulations amend the Wildlife and Countryside Act (1981) (as amended) which provides protection to certain animals under Section 9 and listed in Schedule 5 of the Act. Under the Act (as amended) it is an offence intentionally or recklessly to kill, injure, capture or

disturb bats or to damage, destroy or obstruct access to any place used by bats for shelter or protection.

Roost Assessment

The site contains a range of brick and stone buildings with slate roofs (A & B) and flat felt roofing (C). The buildings were subject to a detailed bat roost assessment as detailed in Section 4.4. Tree roosting potential within the existing site is very limited as there are no mature trees with features for roosting bats such as flaking bark, rot holes, cracks and creeping ivy. There are however some ivy clad trees to the rear of the site that were provisionally assessed as having moderate roost potential. A detailed inspection of all trees within the site found no suitable roosting features, such as holes in tree trunks, cracks in major limbs, and loose bark.

Foraging / Commuting

The hedgerows, tree lines and grassland habitat and the linear building edges provide foraging/commuting habitat for bats. The location of the site and the surrounding area is considered to be of low to moderate value for commuting and foraging bats. The wider landscape contains a variety of habitats including woodland, landscaped areas, grassland, arable fields, open water and hedgerows. It is expected that a variety of bat species may be found in the local area as indicated by the desk study. It is likely that foraging or commuting bats use the site itself to a certain extent.

4.3.3. Great crested newts:

Great crested newt is listed on Annexes II and IV of the EC Habitats Directive. It is protected under the Wildlife and Countryside Act (1981) (as amended) and is identified as a European Protected Species on the Conservation of Habitats and Species (Amendment EU Exit) Regulations 2019. It is a UK BAP Priority Species and is listed on the local BAP.

No records of great crested newt were returned from the desk study and there are no ponds within 500m of the site. The terrestrial habitats within the majority of the site are of low value comprising bare ground, buildings and small isolated islands of vegetation with poor connectivity. There are some stored materials, rubble, brash etc. which provide some refugia. During their terrestrial phase, great crested newts are typically taken to commute up to 500m between their breeding pond and their terrestrial habitats, though as a general rule it is those suitable habitats within 250 m of a breeding site that are likely to be used most frequently and further recent research has shown that the majority of newts occur within 50 m of ponds, with few individuals being found at greater distances (EN, 2004) [5]

However, a proportion of the population is also likely to forage for food and shelter in suitable habitats up to 250m from a breeding pond and juvenile GCN have been known to disperse up to 500m from their breeding pond, in a single season. Following Natural England's GCN licence method statement rapid Risk Assessment tool an offence is highly unlikely.

4.3.4 Reptiles:

All six species of British reptile are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), which protects individuals against intentional killing or injury. Sand Lizard *Lacerta agilis* and Smooth Snake *Coronella austriaca* receive additional protection under the Conservation of Habitats and Species (Amendment EU Exit) Regulations 2019. All six reptile species are also S41 Priority Species.

There are no records of common lizard, grass snake, slow worm or adder within the search area. The site was considered unsuitable for supporting reptiles; comprising in the main of hard standing, buildings and bare ground. Subject to keeping the grass and vegetation within the site mown short there are unlikely to be any impacts on reptile species.

4.3.5 Badger:

Badgers receives legislative protection under the Protection of Badgers Act 1992. The legislation aims to protect the species from persecution, rather than being a response to an unfavourable conservation status, as the species is in fact common over most of Britain. It is the duty of planning authorities to consider the conservation and welfare impacts of development upon Badger and issue permissions accordingly. Licenses can be obtained from Natural England for development activities that would otherwise be unlawful under the legislation. Guidance on the types of activity that should be licensed is laid out in the relevant best practice guidance.

No specific records of Badger setts or badgers within or adjacent to the site were returned from the desktop study.

No evidence of badgers was found during the survey, such as setts, footprints, latrines, feeding evidence or hairs. The lack of permanent grassland across most of the site and the built element is such that badgers are unlikely to be present on site. 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.

4.3.6 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, shrubs, hedging etc. provide some suitable habitat for saproxylic invertebrates, as dead wood is evident in and around the south boundary. However, mature trees with standing deadwood are confined to the south-west corner of the site. 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.

[5] EN 2004 An assessment of the efficiency of capture techniques and the value of different habitats for the great crested newt *Triturus cristatus* English Nature Research Reports.

4.3.7 Hedgehog and Brown Hare:

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. It is probable that hedgehogs are present on this site, at least at times. There is suitable habitat within the adjacent garden habitats, tall herb and grassland. No hedgehogs or droppings were observed during the site survey.

There are no records of brown hare (*Lepus europaeus*) within a 2km radius of the site. The site contains virtually no habitat for this species. Beyond the town the open arable land and pasture fields provide suitable habitat for a form.

4.3.8 Other Protected/Priority Species:

No evidence of other such species was noted. The site lacks core habitat for water vole, otter, hazel dormouse, white-clawed crayfish etc. Other animals recorded by the surveyor onsite include rabbit *Oryctolagus cuniculus.*

4.4 Building inspections

The site consists of a complex of buildings comprising 2 connected school buildings (A & B) which are of stone construction with slate roofs and all of the windows have been boarded up with a protective mesh. To the east is a detached building (C) which is of brick construction with a felted roof and two large roof vents. A further building (D) is shown on the aerial imagery but the building has been demolished and there remains the building foundations. There is missing and dislodged pointing in both buildings A and B and there are large roof voids which could not all be inspected during the preliminary survey. There are also voids around the eaves, stone wall tops, ride capping and some loose and lifted roof tiles which could provide bat roosting opportunities and access to the roof space.

No evidence of any bat roosts was found during the survey apart from some possible feeding remains within the roof space of building B. Both buildings A & B were assessed as having **moderate roost potential.** The detached building C did not appear to have many roosting opportunities apart from some lifting felt roof at eaves level. The building was assessed as having **low roost potential**

In accordance with Bat Surveys-Good Practice Guidelines, J. Collins, 2016 and 'Bat Workers Manual, 3rd Edition, Mitchell and Jones, 2004 buildings with **Moderate** roost potential require one dusk survey and one dawn survey to confirm presence/absence of roosting bats. Building with low roost potential require one dusk survey. An approximate size and eaves height of the retained barns is provided in Table.7.

Building	Floor Area	Eaves Height
A	820m²	5m-7m
B	660m²	3m
C	115m²	4m

Table 7. Building sizes and height

4.4.1 Building A-

Figure 5. North elevation (left), west elevation (right)

Figure 6. Lifted ridge tiles (left), missing ridge tiles and loose slates (right)

4.4.2 Building B-

Figure 7. Roof space (left), south elevation (right)

Figure 8. West roof elevation (left), voids beneath the overhanging roof (right)

4.4.3 Building C-

Figure 9. South elevation and entrance (left), north elevation and flat roof extension (right)

4.4.3 Building D- The building has been demolished and only hardcore foundations remain.

5 IMPACT ASSESSMENT

5.1 Review site impacts assessment

5.1.1 Habitats

The habitats that are within the site are likely to be affected but are of low ecological value, and so the proposed development would **likely** have **minor-adverse** effect on valued ecological receptors. The boundary trees and shrubs are of greater ecological value and could be being utilised by wildlife but probably only on a **Local/Parish** scale. If these are to be removed, this will likely have a **moderate adverse** impact.

5.1.2 Protected Species

The site contains very limited habitat for amphibians and reptiles. The proposed demolition works, access alterations, new access and disturbance to terrestrial habitats around the buildings may impact on small mammals, birds and invertebrates but with reasonable avoidance mitigation the impact on these species is considered to be **minor adverse-neutral.**

The bramble stands, shrubs, trees and buildings also provide nesting opportunities and shelter for birds, invertebrates and small mammals, especially by species such as hedgehog, which are recorded within the area. The boundary walls, trees and hedges are a valued ecological corridor for bats, birds and mammals, therefore should remain if possible.

Bat Species:

No bat roosts were identified within the buildings, however some of the roof spaces and high loft hatches were inaccessible during the preliminary survey. A number of potential roosting features (PRF's) were identified externally such as missing and lifted ridge tiles, missing and loose slate tiles, some voids under the eaves and dislodged or missing pointing in the stone walls of buildings A & B. These building with moderate roost potential require further surveys during the summer of 2022 between May and August inclusive to confirm the presence or absence of roosting bats.

The detached brick building (C) appeared less likely to support roosting bats due to its construction. The potential for roosting bats however can rarely be excluded entirely due to the highly mobile nature of bats and seasonal use of roosts and so a precautionary approach to demolition works to the buildings will be implemented through a reasonable avoidance mitigation statement (RAMS). Any mitigation and requirements for a mitigation license are unknown pending the results of the further summer surveys.

6 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 NPPF13[6]. Suggestions for enhancement are provided below in Section 9.

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

[6] National Planning Policy Framework (NPPF) 2018

6.1 Demolition and Ground Clearance Works-

• As per the recommendations above building demolition, vegetation clearance and tree works 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 (brash, wood piles, sheet materials) would be hand-searched for the presence of hedgehogs, reptiles and amphibians prior to commencement of works.

• Care should be taken with regards to vegetation clearance and earthworks due to potential disturbance to nesting birds, herpetofauna and small mammals.

6.2 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 new buildings 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, such as roosting bats, reptiles or great crested newt, 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.

6.3 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 tree canopies, hedges or adjacent gardens. Low intensity lighting should be used where possible in place of high intensity discharge or sodium lamps, this will minimize disturbance to foraging and commuting bats. In accordance with the Bat Conservation Trust's publication *Bats and artificial lighting* (BCT, 2018) light pollution by artificial lighting will be kept to a minimum and light spillage avoided. The following specific mitigation will be put in place to minimize disturbance to bats caused by the lighting of the site. The following mitigation strategies have been taken from Bat Conservation Trust Landscape and Urban Design for Bats and Biodiversity (Gunnell et al., 2012) and other referenced sources:

- Minimise light spill by eliminating any bare bulbs and upward pointing light fixtures. The spread of light should be kept near to or below the horizontal plane, by using as steep a downward angle as possible and/or shield hood. Flat, cut-off lanterns are best;
- Use light sources that emit minimal ultra-violet light (van Langevelde and Feta, 2001) and avoid the white and blue wavelengths of the light spectrum, so as to avoid attracting insects and thus potentially reducing numbers in adjacent areas;
- Limiting the height of lighting columns to eight metres and increase the spacing of lighting columns (Fure, 2006) can reduce the spill of light into unwanted areas;
- Avoid using reflective surfaces under lights or light reflecting off windows (e.g. on to trees);
- Only the minimum amount of light needed for safety and access should be used and or turned off when the site is not in use;
- Artificial lighting proposals should not directly illuminate boundary habitats, which may be of value to foraging or commuting bats and birds (e.g. green corridors);
- Lighting that is required for security reasons should use a lamp of no greater than 2000 lumes (150 Watts) and be PIR sensor activated, to ensure that the lights are not on only when required (Jones, 2000; Collins, 2016);

6.4 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 15th September then a breeding/nesting bird survey should be first undertaken by the SQE.

• 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.

6.5 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.

7 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.

7.1 Habitat Supplementation-

7.1.1 Birds – To increase nesting opportunities generally, nest boxes will be installed. Installation of the nest boxes will be supervised by 'Eco- Check Ltd' or an experienced ecologist to ensure the correct positioning for each species. The types of nest boxes will cover a range of species and will include 10 boxes;

- 2 x Eco-Roost (32mm)
- 2 x Eco-Roost (28mm)
- 2 x Eco-Roost wren roundhouse boxes
- 2 x Eco-Roost deep nest boxes for robins
- 2 x Eco-Roost house sparrow terrace boxes

7.1.2 Bats- Avoidance measures will include supervised removal of areas of bat roosting potential, a licensed bat worker should undertake the following works during the course of the development works:

• All staff working on site will receive a toolbox talk (TBT) prior to the commencement of works. The TBT will focus on PRFs, protective legislation, and the risk of bat presence on-site. Demolition works will commence with PRFs such as damaged fascias and corrugated sheets, cladding, slates, ridge tiles etc. carefully removed by hand in a 'soft-strip' fashion. Any damaged sections of timber/sheet materials will similarly be removed by hand, with care and attention also given to any other areas showing signs of suitable structural damage (i.e. with a potential crevice behind or between such as a cavity between external cladding and internal timber boards). In the event that any bats are found during these works, they will be safely moved to one of the pre-erected bat boxes;

• Excluding any potential roosting cavities prior to development works commencing. This is usually achieved through the use of one-way flaps over roost entrances and is only effective during the active bat season.

New Roosting Provision of new bat roosting opportunities forms part of the mitigation/enhancement strategy:

The built scheme will take the opportunity to enhance and replace roosting opportunities through the provision of bat boxes and bat bricks. As part of general biodiversity enhancement for the site, it is recommended that new bat roosting resources are introduced. This will include bat roosting boxes erected on the converted buildings and/or incorporated into the brickwork (**Appendix 3**):

- 6 bat bricks incorporated into the new buildings
- 3 Kent bat boxes, including a winter hibernation box attached to the trees or buildings
- During construction the new fascia boards should be proud of the wall by c15/20mm to allow roosting by bats.

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

7.1.3 New Planting. Ornamental plants and shrubs to be planted within gardens and green open space provisions. Where non-native species are proposed, these should include species of value to wildlife, such as varieties listed on the RHS' 'Plants for Pollinators' database, providing a nectar source for bees and other pollinating insects.

7.1.4 Plant native broad-leaved trees. Suggested species will reflect those in the local area and could 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.

7.1.5 New grassland seed mix. Integrating a species rich amenity seed mix (WFG20) into the new development plans, will significantly improve the recreational areas for species such as butterflies and bees and other invertebrates.

7.1.6 Hedge Planting Schedule

New native species hedges could be planted along the west boundary wire fence. 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*), Dogwood (*Cornus Sanguinea*) and Buckthorn (*Frangula alnus*), See Table 8.

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. The proposed hedgerow mix is beneficial to wildlife and planting to the following specification;

PLANTING SCHEDULE				
HEDGEROW MIX (As necessary)				
SPECIES	DENSITY	AGE	ROOT	HEIGHT
20% Blackthorn (*Prunus spinosa)*	0.45m	1+1 or 1/1	BR	40-60cm
50% Hawthorn (*Crataegus monogyna)*	0.45m	1+1 or 1/1	BR	40-60cm
10% Buckthorn (*Frangula alnus*)	0.45m	1+1 or 1/1	BR	40-60cm
10% Field maple (*Acer campestre)*	0.45m	1+1 or 1/1	BR	20-30cm
10% Dog Wood (*Cornus sanguinea)*	0.45m	1+1 or 1/1	BR	20-30cm

Table 8.- Proposed Hedgerow Planting Mix

8 ECOLOGICAL CONDITIONS AND RECOMMENDATIONS FOR FURTHER SURVEYS

The overall impact assessment does not take into consideration those species for which further information is required. To fully assess the site for, and the impact of the proposed development upon, protected species, detailed survey is recommended for the following species:

- Destruction of in-use nests or harm to adult birds caused by demolition of buildings, 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 a suitably qualified ecologist (SQE).

- Preliminary Tree Roost Assessment (PRA)- If semi-mature or mature trees are likely to be impacted upon, i.e., where trees will be removed, root protection zones cannot be adhered to, or management is recommended by the appointed arborist, a Preliminary Tree Roost Assessment of the trees must be undertaken.

- Buildings A and B have **moderate bat roosting** potential and building C has **low roost potential**. Further summer dusk and dawn bat emergence and return to roost surveys are required to confirm the presence or absence of roosting bats. Similarly, some of the high roof spaces were not accessible and so a tower is to be provided to undertake a bat survey of these areas.

- An Ecological Constraints and Opportunities Plan (ECOP) would highlight the boundary habitats as a moderate (and ultimately replaceable) constraint on development. Before the start of construction, it is recommended that in line with the British Standard 42020:2013 Biodiversity – Code of practice for planning and development - that a Construction Environment Management Plan (CEMP) is submitted and approved. The role of the CEMP 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 CEMP is also to ensure that biodiversity protection zones are enforced.

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, January 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.

9 REFERENCES

British Standards Institution (2013). BS42020 – Biodiversity – Code of practice for planning and development.

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Natural England, MAGIC MAP Search, December 2021, www.magic.gov.uk

This survey was carried out and an assessment was made of the site at a particular time. The evidence this report contains can be used to draw conclusions as to the likely presence or absence of bats and the likely impacts of any proposed development works. The survey should not be regarded as a complete study, rather a snapshot in time. Every effort has been taken to provide an accurate assessment of the situation pertaining to this site at the time of the survey but no liability can be assumed for omissions or changes after the survey has taken place.

PROTECTED SPECIES

This report contains sensitive information relating to protected species. The information contained herein must not be disseminated without

Appendix 1

Site Location Plan and Red outline of application site


0m 5m 10m 15m 20m 25m
VISUAL SCALE 1:250 @ A1
N
HAUFRYN
STRYD RHOS / RHOS STREET
440m² AMENITY SPACE
KEY
APARTMENTS (AFFORDABLE)
4P2B PRIVATE
5P3B PRIVATE
5P3B SIDE ENTRY PRIVATE
7P4B PRIVATE
1 PROPOSED PLOT MIX
SCALE: 1 : 250
RHOS STREET
for MEDRA
SITE LAYOUT PLAN
PRELIMINARY
C1083 005 B
AINSLEY GOMMON ARCHITECTS
A1

3D AERIAL VIEW 5 - FROM THE ENTRANCE

REV	DESCRIPTION	DATE	BY
C	REVISED AFFORDABLE UNITS AND SITE FENCING	20.01.22	NG
B	PLOT 1 + FLAT ELEVATIONS CHANGED	05.01.22	IO
A	SITE PLAN UPDATED	23.12.21	MR

PROJECT
RHOS STREET
for MEDRA

DRAWING TITLE
3D AERIAL VIEW 5 - FROM THE ENTRANCE

SCALE	DATE	DRAWN	CHECKED
@A3	12/07/21	IO	SV

DRAWING STATUS: PRELIMINARY

JOB No	DRAWING No	REVISION
C1083	034	C

AG | AINSLEY GOMMON ARCHITECTS
THE OLD POLICE STATION, 15 GLYNNE WAY, HAWARDEN, CH5 3NS
Tel: 01244 537 500 | wales@agarchitects.co.uk | www.agarchitects.co.uk
Ainsley Gommon Architects Ltd. Registered in England & Wales No.4187968
Registered Office: 1 Prize Street, Hamilton Square, Birkenhead CH41 6JR

PRINTED: 20/01/2022 16:56:57

A3

Appendix 2

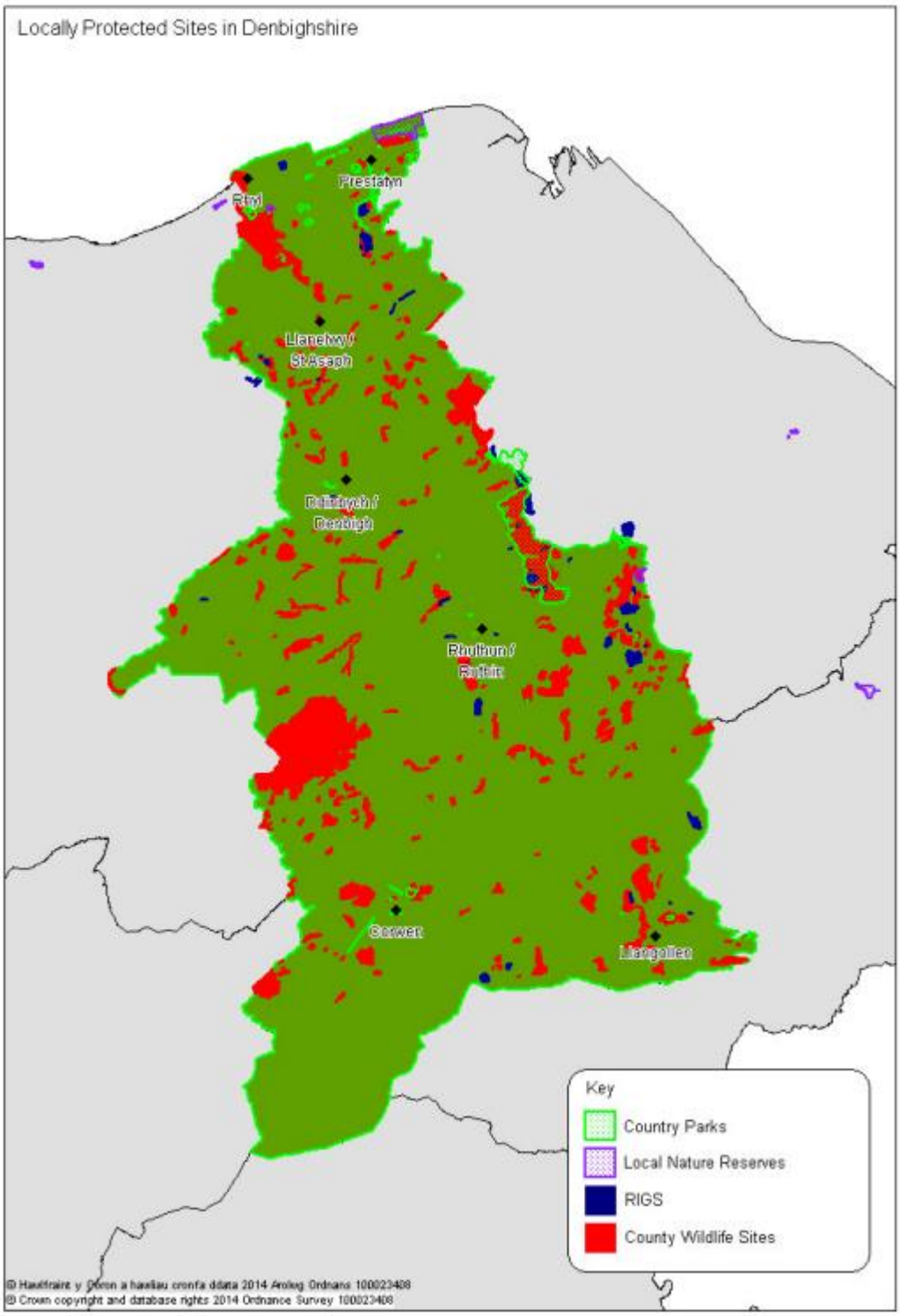
Locally Protected Sites in Denbighshire
Prestatyn
Rhyl
Llanelwy / St Asaph
Dinbych / Denbigh
Rhuthun / Ruthin
Corwen
Llangollen
Key
Country Parks
Local Nature Reserves
RIGS
County Wildlife Sites
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Table 6.1 *Guidance on the optimal timing for carrying 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					See Jan to June
Bats	Surveys	*	Inspection of hibernation, tree and building roosts			No surveys	Activity surveys and inspection of building roosts. Emergence counts.					No surveys	Inspection of hibernation, tree and building roosts	
	Mitigation	**	Works on maternity roosts		Works on maternity roosts until mid-May. Works on hibernation roosts from mid-March			Works on hibernation roosts only			Hibernation roosts until November. Maternity roosts from mid-September		Works on maternity roosts only	

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.

Wildlife & Construction
Best Practice Guidance

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 manor 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 - 34°C.
- Strim 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.

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 nest's 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 manor 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 habitat.

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 newt 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.

MVV Environment
KIER URS

URS Ltd
Mayflower House
Armada Way
Plymouth
Devon PL1 1LD
01752 676700

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 manor and supervised by an ecologist.
- **STOP!** if you think you have found a reptile or amphibian on site, stop all works and consult an ecologist immediately.

TREES AND HEDGEROWS

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

URS
MVV-Environment
KIER

URS Ltd
Mayflower House
Armada Way
Plymouth
Devon PL1 1LD
01752 676700
paul.gregory@scottwilson.com
www.urscorp.eu

Bat Conservation Trust

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 season[3]. 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 cross[5]. 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) process[6]. 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)

guides[7]. 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 Plans[8]. In instances lacking classification, it may be necessary to request a Baseline Lighting Assessment/Survey conducted by a Lighting Professional in order to inform the classification of areas, particularly for large-scale schemes and major infrastructure projects.

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

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

Principles and design considerations

Do not

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

Avoid

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

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/

[7] http://planningguidance.planningportal.gov.uk/blog/guidance/light-pollution/when-is-light-pollution-relevant-to-planning/
[8] Institution of Lighting Professionals (2011) Guidance Notes for the Reduction of Obtrusive Light GN01:2011.

Appendix 3

Eco-Roost Bat Brick	
Eco-Roost Double Chamber Bat Box	
Eco-Roost Double Kent Box	
Eco-Roost 28mm, 32mm and Open fronted bird boxes	

Examples of Bat Boxes

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

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

Bird Nesting Habitat

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 sky-light, 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.