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Ecological Impact Assessment

The Maharaja,
39 Cliff Rd,
Newquay,
TR7 2NE

October 2022

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QUALITY CONTROL		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.		
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<p>This report remains valid for 12 months from date of issue.</p> <p>Survey data are valid for 12-18 months from the date the survey was undertaken.</p>		

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Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living creatures are capable of migration and whilst protected species may not have been located during the survey duration, their presence may be found on site at a later date.

The views and opinions contained within the document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to works.

1. EXECUTIVE SUMMARY

- 1.1. Darwin Ecology Ltd was commissioned by Mrs H Swansbury to undertake an EclA for the building at 39 Cliff Rd, Newquay, TR7 2NE. The assessment was required to support a planning application for a change of use proposal and was informed by a desk study and internal/external building inspection.
- 1.2. No plans are available at the time of writing.
- 1.3. The main building on site is used for as a restaurant currently. The survey did not identify any potential roost features suitable for bats. The building was assessed as being of **Negligible** potential to support roosting bats.
- 1.4. Therefore, the proposals to convert the building will not directly impact any roosting bats and no further surveys are required. Enhancements to the new building in the form of integrated bat features would provide additional roosting features for crevice-dwelling bats that may be present in the area.
- 1.5. Depending on the scale of the works, the surrounding landscape bounds an area of priority habitat Maritime cliffs and may be sensitive to disturbance.

2. INTRODUCTION AND BACKGROUND

- 2.1. Darwin Ecology Ltd was commissioned to undertake an EclA for the building at The Maharaja, 39 Cliff Rd, Newquay, TR7 2NE. The assessment was required to support a planning application for a change of use, and was informed by a desk study and internal/external building inspection.
- 2.2. There are no proposed plans available at the time of writing.
- 2.3. The internal/external building inspection followed the Bat Conservation Trust (BCT) Good Practice Guidelines (2016).

Site Overview

- 2.4. The site comprises a semi-detached commercial three-storey commercial building. The building comprised of a typical brick building, and slate roof with rendered exterior and gravel-laid rear garden.
- 2.5. The site is located within the town of Newquay. The immediate area comprises of residential and commercial properties on the east and west of the shorefront and cliffs and a beach immediately north of the site. (**Map 1**)
- 2.6. The surrounding habitats comprise most of the town of Newquay dominated by residential properties and their associated small gardens. (see **Map 2**).

Scope of Assessment

- 2.7. The process of EclA aims to identify, quantify and evaluate the potential effects of development-related or other proposed actions on habitats, species and ecosystems.
- 2.8. Potential effects on the following ecologically sensitive receptors have been considered during the EclA:
 - Statutory and non-statutory designated sites; and
 - Features of potential importance (such as loft voids or external crevice features).



Map 1: Site location and approximate site boundary within the local landscape (Copyright Google Earth, 2022)



Map 2: Site location within the wider landscape (Copyright Google Earth, 2022)

3. LEGISLATION & POLICY

General Wildlife Legislation

- 3.1. Wildlife in the United Kingdom (UK) is protected through European and national legislation, supported by national and local policy and guidance. Development can contribute to conservation and enhancement goals outlined by this various legislation and policy by retaining and protecting the most valuable ecological features within a site and incorporating enhancements to provide biodiversity net gain.
- 3.2. This section provides a brief summary of the principle legalisation and policy that triggers the requirement for preliminary and further ecological assessments in the UK. The presence of protected species within a site is a material consideration during the planning process. Preliminary and any necessary further ecological assessments provide an ecological baseline for a site and evaluation of the potential impact of proposals.
- 3.3. It is the responsibility of those involved with development works to ensure that the relevant legislation is complied with at every stage of a project. Such legislation applies even in the absence of related planning conditions or projects outside the scope of the usual planning process (i.e. permitted development projects or projects requiring Listed Building Consent only).

Bat Legislation

- 3.1. In England and Wales, all bat species and their roosts are legally protected under the European *Habitats Directive (1992)*; the *Conservation of Habitats and Species Regulations (2017)*; the *Wildlife and Countryside Act (1981) (as amended)*; the *Countryside and Rights of Way Act, 2000*; and the *Natural Environment and Rural Communities Act (NERC, 2006)*.
- 3.2. Barbastelle *Barbastella barbastellus*, Bechstein's *Myotis bechsteinii*, greater horseshoe *Rhinolophus ferrumequinum*, lesser horseshoe *Rhinolophus hipposideros*, brown long-eared, soprano pipistrelle *Pipistrellus pygmaeus*, and noctule *Nyctalus noctula* bats are all species of principal importance in England under *Section 41* of the *Natural Environment and Rural Communities Act 2006*.
- 3.3. You will be committing a criminal offence if you:
 - Deliberately capture, injure or kill a bat;
 - Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
 - Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
 - Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat; or
 - Intentionally or recklessly obstruct access to a bat roost.

- 3.4. The government's statutory conservation advisory organisation, Natural England, is responsible for administering EPS licenses that permit activities that would otherwise lead to an offence.
- 3.5. A licence can be obtained if the following three tests have been met:
- Regulation 53(9)(a) - there is "no satisfactory alternative" to the derogation, and;
 - Regulation 53(9)(b) - the derogation "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" and;
 - Regulation 53(2)(e) - the derogation is for the purposes of "preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment".

National Planning Policy

- 3.1. The *National Planning Policy Framework (2021)* aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications.
- 3.2. Planning policies and decisions should contribute to and enhance the natural and local environment by:
- 174 a) Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - 174 b) Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - 174 d) Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
 - 175) Plans should: distinguish between the hierarchy of international, national and local designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement

of natural capital at a catchment or landscape scale across local authority boundaries;

176) Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and Broads. The scale and extent of development within all these designated areas should be limited, while development within their settings should be sensitively located and designed to avoid or minimize adverse impacts on the designated area.

4. Specific policies regarding habitats and biodiversity comprise:

179) To protect and enhance biodiversity and geodiversity, plans should:

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

180) When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside of Sites of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the feature of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around development should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Local Planning Policy

4.1. Local Policy: The new Local Plan for Cornwall was adopted on the 22nd November 2016. The key relevant policies from the Local Plan relating to ecology and nature conservation are Policy 22 (European Protected Sites) and Policy 23 (Natural Environment). Policy 22 is detailed below:

- For residential development and student and tourist accommodation, mitigation measures for recreational impacts on European Sites will be required where development is proposed within the identified zones of influence around those European Sites that are vulnerable to adverse recreational impacts. Residential development, and student and tourist accommodation within these zones of influence will be required to provide for appropriate management, mitigation and monitoring on Site, and/ or financial contributions towards off-Site mitigation and management. This will need to be agreed upon and secured prior to the approval of the development.

4.2. Policy 23 comprises a number of measures for development proposals including:

- Development should conserve, protect and where possible enhance biodiversity and geodiversity interests and soils commensurate with their status and give appropriate weight to their importance (3).
- All development must ensure that the importance of habitats and designated Sites are taken into account and consider opportunities for the creation of a local and county-wide biodiversity network of wildlife corridors which link County Wildlife Sites and other areas of biodiversity importance (3);
- The highest level of protection will be given to potential and existing Special Protection Areas, candidate and existing Special Areas of Conservation and listed or proposed RAMSAR Sites (3a).
- Development proposals within or outside an SSSI or Marine Conservation Zone which would be likely to adversely affect the Site (either individually or in combination with other developments) will not be permitted unless the benefits of the development, at

this Site, clearly outweigh both the adverse impacts on the Site and any adverse impacts on the wider network of SSSI and Marine Conservation Zones (3b). -

- Development likely to adversely affect locally designated Sites, their features or their function as part of the ecological network, including County Wildlife Sites, Local Geological Sites and Sites supporting Biodiversity Action Plan habitats and species, will only be permitted where the need and benefits of the development clearly outweigh the loss and the coherence of the local ecological network is maintained (3c).
- Adverse impacts on European and UK protected species and Biodiversity Action Plan habitats and species must be avoided wherever possible (i) subject to the legal tests afforded to them, where applicable (ii) otherwise, unless the need for and benefits clearly outweigh the loss (3d).
- Development must avoid the loss or deterioration of ancient woodland and veteran trees, unless the need for, or benefits of, development on that Site clearly outweigh the loss (3e).
- Development should avoid adverse impact on existing features as a first principle and enable net gains by designing landscape and biodiversity features and enhancements, and opportunities for geological conservation alongside new development. Where adverse impacts are unavoidable they must be adequately and proportionately mitigated. If full mitigation cannot be provided, compensation will be required as a last resort (4).

Cornwall Biodiversity Action Plan

- 4.3. The Cornwall Biodiversity Action Plan (BAP) has been developed since 1996 by the Cornwall Biodiversity Initiative (CBI). The first two volumes published in 1996 identified priorities for conservation and provided action plans for the Cornish priority habitats and species. Subsequent updates published in 2004 and 2011 were produced to enable local conservation work to contribute to UK BAP targets and in response to updated UK BAP lists of priority habitats and species, the UK strategic biodiversity framework and the Lawton Review.
- 4.4. The targeted habitat and species action plans highlight the UK BAP priority habitats and species that occur in Cornwall and are comprised of 25 habitats and 127 Species Action Plans, written by local experts. The priority habitats of importance in Cornwall include many coastal habitat types, woodland, Cornish hedges and heathland. Priority species identified include six bat species, 41 bird species and many more invertebrate species, plant species and marine species.
- 4.5. The CBI works in partnership with a number of organisations to:

- Incorporate the principles for conservation of priority species and habitats into strategic planning and influence the Core Strategy for Cornwall.
- Develop planning policies which will help deliver enhancement and protect biodiversity and geodiversity for the benefit of local communities.

Cornwall Planning for Biodiversity

4.6. Cornwall Council has committed to the principle of net gain for biodiversity with the following requirements:

- Each new residential unit must provide at least one bat or bird box/brick and one bee brick must be provided for every other unit (i.e. one bee brick per two dwellings).
- Other developments, including commercial, educational, and transportation are required to provide a scheme including integrated boxes for bats and birds. Provision of artificial nest sites is required due to the lack of nesting opportunities in modern building design.
- Boxes need to be built into the units on-site as other types of boxes e.g. tree mounted or surface mounted to buildings, have a very limited lifespan. However, to allow some flexibility within site design up to 25% of boxes may be tree mounted.
- All post-development fences on site are also required to have holes of at least 13cm diameter to allow the passage of hedgehogs and other small mammals, reptiles and amphibians.

5. METHODOLOGY

Desk Study

- 5.1. A desk study was undertaken for designated sites, European Protected Species (EPS) records and habitat records within 1 km of the site:
- The MagicMap website was reviewed, to obtain information on any designated sites of nature conservation interest within 1km of the site and details of any EPS licences issued within 1km;
 - The Cornwall Council Planning Portal was searched for past and pending planning applications that may have associated ecological documents detailing the results of bat surveys; and
 - Cornwall Council Interactive Map was used to find non-statutory designated sites and Natura 2000 Zones of Influence (ZOI).
 - Google Maps and Ordnance Survey (OS) Leisure Maps were utilised to view aerial photographs, to assess the ecological context of the site within the wider landscape.

Preliminary Roost Assessment

- 5.2. Ecologist Genevieve Labram MSc conducted a PRA at the site on 15th of September 2022 in accordance with the following methodology:

External Survey

- 5.3. An investigation was carried out of external features with potential for use by roosting bats, such as gaps under roof and ridge tiles, and gaps at soffit boxes or fascias. A search for bat droppings was made beneath each potential entry/exit point identified where accessible. The surveyor used binoculars and a powerful, low-heat LED torch.

Internal Survey

- 5.4. An investigation was carried out of the roof void (including the floor and walls) for signs of bats roosting and the access potential into the roof void for bats. The surveyor looked for bats, bat droppings, likely access points, signs of feeding, dead bats, scratch marks and staining, and made a suitability assessment of the structure of the roof.

Potential to support roosting bats

- 5.5. Each building was assessed for its potential to support roosting bats as detailed in Table 1 below which is taken from the Bat Conservation Trust 2016 guidelines Table 4.1 and Table 7.3.

Table 1: Roost Classification from the Bat Conservation Trust (2016) guidelines.

Category	Description of Roosting habitat	Number of Surveys required
Negligible	Negligible habitat features on site likely to be used by roosting bats.	No further surveys
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, protection, appropriate conditions and or suitable surrounding habitat to be used on a regular basis by large numbers of bats.	Single survey between May to August
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, condition and surrounding habitat but unlikely to support a roost of high conservation status.	Two separate surveys with one dusk and one dawn re-entry survey between May-August.
High	A structure with one or more potential roost sites that are obviously suitable for use by a larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Three separate surveys with at least one dawn survey.

Limitations

5.6. Full access both internally and externally was granted at the time of the site visit.

6. SURVEY RESULTS

Desk Study

Statutory and non-statutory sites

- 6.1. A single designated site for nature conservation was found within 1km of the site which is Bristol Channel Approaches Special Area of Conservation (SAC). These are outlined in Table 2 below.

Table 2: Statutory designated sites within 1 km of the site.

Designated sites	Name and designation type	Reason for designation	Approximate distance from site
Within Site Boundaries	There are no designated sites within the site boundaries		
Within 1km of the site	Bristol Channel Approaches SAC	The site has been identified for the protection of harbour porpoise	100m north

SSSI Impact Risk Zone

- 6.2. The site is within 4km east of the boundary for Kelsey Head Site of Special Scientific Interest (SSSI) and within the associated SSSI Impact Risk Zone. This impact risk zone does not have any restrictions on residential developments and so the proposals for the site do not require consultation.

Priority Habitats and Ancient Woodland

- 6.3. There are no priority habitats within the site, however, the site is adjacent to a large section of maritime cliffs and slopes located immediately to the north. Further priority habitats within 1km of the site include a small amount of priority deciduous woodland located 500m south of the site. No areas of ancient woodland were located within 1km of the site.
- 6.4. There are no European Protected Species Licences for bats within a 1km radius of the site.

Cornwall Council Planning Portal

- 6.5. There are no previous applications on the site.
- 6.6. No further applications with supporting bat survey reports with any particular relevance to the site were identified.

Preliminary Roost Assessment

- 6.7. A single building is present on-site, a commercial restaurant building subject to regular use.
- 6.8. The building is a three-storey, semi-detached brick building with areas of pitched roof covered with slate tiles and flat-roofed areas covered in bitumen felt. The building has a brick dormer on the eastern elevation and an attached glass conservatory to the north. The building was in very good condition with no obvious gaps observed externally suitable for roosting bats.
- 6.9. Internally a single small void was present measuring roughly 1m in height, 3m in width and 6m in length. This void had a timber frame and was lined with bitumen felt with a brick gable at both ends. The space was slightly cluttered being used for light storage. No areas of light ingress were noted throughout the void.
- 6.10. The coastal location of this site offers sub-optimal habitat for foraging bats due to its exposure and lack of mature hedgerows or areas of woodland nearby.
- 6.11. No evidence of bats was found on site.
- 6.12. No access for bats is possible under the felt or tiled roofs and the roofs were in excellent condition.
- 6.13. Overall the building is considered to offer **Negligible** suitability for roosting bats.

Birds

- 6.14. No evidence of nesting birds was recorded on site. The surrounding hedges on-site offer some suitability for nesting birds, however, the cover is largely sparse and unsuitable.

Habitats

- 6.15. A full Preliminary Ecological Assessment has not been commissioned, however, a walkover of the habitats on site was conducted and habitats are briefly described below.
- 6.16. The majority of the site is comprised of hardstanding of concrete, gravel and patio, with only potted ornamental plant species associated with this space.
- 6.17. The habitats on site provide low suitability for any further protected species.



Image 1: Front view of the main building.



Image 2: Rear view of the main building.



Image 3: View of the eastern elevation of the main building



Image 4: View of the front and eastern elevation of the main building



Image 5: A view of the small loft void found within the building

7. IMPACT ASSESSMENT

Designated Sites

- 7.1. Considering the scale of the proposed, and the distance to any protected areas, there are no anticipated impacts and no recommended mitigation for designated areas or priority habitats.

Habitats

- 7.2. The habitats on site are limited to hardstanding and semi-permeable gravel and offer limited ecological suitability. No further surveys are recommended and any loss of these habitats will not significantly impact any important foraging or commuting areas for bats and other wildlife to forage.

Status of Bats on Site

- 7.3. The proposed works will not result in the loss or impact of bat roosts and therefore, works can proceed without any requirement of a protected species licence or further surveys.

- 7.4. In the unlikely event that a bat is discovered during the works, works must cease immediately and a bat licence ecologist contacted for advice.**

- 7.5. Lighting: Any new external lighting must not illuminate bat access points and must be directed to avoid light spillage onto vegetation, particularly linear habitat features such as the gardens and hedgerows at the east of the site. Bats are sensitive to light and could potentially avoid the area if access points or the surrounding areas become lit. Minimising the periods of lighting and using motion sensors is strongly recommended, using a short-timer to reduce the duration of lighting and reduce disturbance to bats. It is important to direct the light only where it is needed and avoid light spillage onto vegetated margins. Upward lighting can be minimised by fitting lights with downward-facing baffles to avoid light pollution. Preventing light spillage above an angle of 70 degrees can be achieved by using fixtures that shield the bulb and direct the light downward. Warm white LEDs are less harmful to bats than bright white LEDs. If appropriate measures are taken to reduce light spillage from the development, there will likely be no negative impacts on local bat populations.

- 7.6. See the Appendix for further information on designing lighting to minimise impacts on bats.

- 7.7. *Habitats*: The proposals do not result in a significant loss of foraging habitat for bats, however, a wildlife-friendly landscaping scheme is recommended to enhance the site for bats and other wildlife.

Status of Birds on Site

- 7.8. There are no active bird nests noted within the site, however, the survey was conducted outside of breeding bird season.

Recommendations

- 7.9. If impacts to the external areas of the building are required during the breeding bird season (February-September inclusive), a pre-works check by a suitability-qualified ecologist will be conducted to ensure that no active nests are present. If active nests are recorded then work will not be permitted until all chicks have fledged (to be confirmed by a suitably qualified ecologist).

8. ENHANCEMENT RECOMMENDATIONS

- 8.1. National planning policy states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not. Incorporating enhancement features into new or renovated buildings should be carefully considered. These features can be simple and inexpensive, please see below for specific recommendations.

Bats

- 8.2. While detailed proposals are not available at this stage, it is recommended that where possible integrated features on the barge board or bat boxes integrated within the walls of the building should be installed to provide roosting opportunities for bats. These should be placed away from artificial lights on an eastern, or southern. Further details on the installation of integrated bat features are available in the appendix.
- 8.3. There are no mature trees on-site or in close proximity to site that would be suitable to mount bat boxes.

Wildlife Beneficial Landscaping Scheme

- 8.4. Any future landscape planting should seek to enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of wildlife. All amenity planting and formally landscaped areas should be designed using a variety of plant species beneficial for wildlife. These do not necessarily have to be native but should be chosen for their ability to provide nectar or fruit and should be non-invasive species. There are a number of specialist seed mixes available specific to certain soil types, growing conditions and designed to benefit different groups of species such as bees or butterflies and moths.
- 8.5. All habitats should be managed in a suitable way to encourage a wide variety of insects and other wildlife to use the site.
- 8.6. Further information regarding habitat creation, enhancement and management can be provided on request and submitted with further survey results for the final planning application.

9. REFERENCES

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APPENDIX 1 - PROTECTED SPECIES LEGISLATION

Bats

In England and Wales, all bat species and their roosts are legally protected under the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010). You will be committing a criminal offence if you:

- Deliberately capture, injure or kill a bat
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time)
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat
- Intentionally or recklessly obstruct access to a bat roost

Barbastelle, Bechstein's, greater horseshoe, lesser horseshoe, brown long-eared, soprano pipistrelle, and noctule bats are all priority species under the UK Biodiversity Action Plan (UK BAP) and have also been adopted as species of principal importance in England under Section 41 of the NERC Act 2006.

Badgers

Badgers and their setts are afforded strict protection under the Protection of Badgers Act 1992. This Act consolidates past badger legislation and, in addition to protecting the badger itself, makes it an offence to damage, destroy or obstruct badger setts. Badgers are also protected under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended), and listed under Appendix III of the Bern Convention, as a species that is in need of protection but may be hunted in exceptional instances. Only badger setts that are currently in use are covered by wildlife legislation.

Birds

All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or to take, damage or destroy the nest or its eggs.

Some bird species, such as the barn owl *Tyto alba*, are listed in Schedule 1 of the 1981 Act and receive further protection, making it an offence to intentionally or recklessly disturb these birds whilst building a nest or in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird.

The NERC Act (2006) inserts a new schedule into the Wildlife and Countryside Act (1981) to protect the nests of some bird species that regularly re-use their nests, even when the nests are not in use. This protection currently applies to golden eagle, white-tailed eagle and osprey.

Reptiles

All British reptiles are listed under schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are therefore protected from intentional killing or injury. This is largely as a consequence of a national decline in numbers associated with habitat loss.

Two scarcer native British reptiles (smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis*), are afforded 'full' protection. This legislation makes it an offence to intentionally or recklessly kill, injure, disturb, take, possess or sell these species (in all life stages). It is also illegal to damage, destroy or obstruct access to places they use for breeding, resting, shelter and protection.

All species of reptile are priority species in the UKBAP and have been adopted as Species of Principal Importance under Section 41 of the NERC Act (2006) in England (Section 42 in Wales).

Amphibians

Great crested newts (GCN's) *Triturus cristatus* and their habitats are fully protected by the Conservation of Habitats and Species Regulations (2010) and partially protected under the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to kill, injure or capture GCN's, their young or eggs, or destroy / damage their ponds or places of shelter used for breeding or protection. The great crested newt is also a Priority species in the UK Biodiversity Action Plan (UKBAP), and had been adopted as a Species of Principle Importance in England under Section 41 of the NERC Act 2006.

The natterjack toad *Epidalea calamita* is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2010 making it a European Protected Species. The natterjack toad is also a priority species under the UK Biodiversity Action Plan.

The pool frog *Rana lessonae* is protected under the Conservation (Natural Habitats &C.) Regulations 1994 (as amended). As a European protected species the deliberate capturing, disturbing, injuring or killing of this species is prohibited, as is damage or destruction of its breeding sites or resting places. The pool frog is also a priority species under the UK Biodiversity Action Plan due to a 100% decline over 25 years (1980-2005).

Common toads *Bufo bufo* are also designated UKBAP species due to a serious decline of populations across large areas of southern, eastern and central England, thought to be mainly due to changes in habitat management, mortalities on the roads, and climate change.

Dormice

Common dormice *Muscardinus avellanarius* and their habitats are fully protected by both the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations (2010). This legislation makes it an offence to kill, injure, disturb or capture dormice, or destroy or obstruct their resting or breeding places.

The dormouse is also a priority species under the UK Biodiversity Action Plan and has been adopted as a species of Principal Importance in England under Section 41 of the NERC Act 2006 (section 42 in Wales) and so is protected from any adverse effects as a result of development.

Otters

Otters *Lutra lutra* are protected by both the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010. This legislation makes it illegal to; deliberately or recklessly kill, injure or capture an otter, deliberately or recklessly disturb or harass an otter, damage, destroy or obstruct access to a breeding site or resting place of an otter.

The otter is also a UK BAP Priority Species and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act 2006 (Section 42 in Wales) and the Conservation (Scotland) Act in Scotland.

Water Voles

Water voles *Arvicola terrestris* are fully protected under the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to kill or injure water voles, and to damage, destroy or obstruct access to places used for protection or shelter, and to disturb water voles whilst they occupy such a place.

The water vole is also a Priority species in the UK Biodiversity Action Plan, and had been adopted as a Species of Principle Importance in England under Section 41 of the NERC Act 2006.

White-clawed Crayfish

The white-clawed crayfish *Austropotamobius pallipes* is protected under the Wildlife and Countryside Act 1981 (as amended), making it a criminal offence to; intentionally or recklessly kill or injure a white-clawed crayfish, or sell or

attempt to sell any part of this species. The Habitats Regulations (2010) provide further protection through the declaration of Special Areas of Conservation (SAC). This protection aims to prevent commercial harvesting of white-clawed crayfish and prohibits their capture without a licence.

The white-clawed crayfish is also a Priority species in the UK Biodiversity Action Plan (BAP), and has been adopted as a Species of Principal Importance in England under Section 41 of the NERC Act 2006.

Hedgehogs

Hedgehogs are UK Biodiversity Action Plan (BAP) species, and therefore must be taken into consideration as part of development planning. A recent report (Wembridge, 2011) shows that hedgehog numbers have declined by 25% in the last ten years.

APPENDIX 2 - SURVEY AND REPORTING LIMITATIONS AND EXCEPTIONS

This report and its survey results should be considered in conjunction with the terms and conditions proposed and scope of works agreed between Darwin Ecology Ltd and the client.

This report has been produced in the context of the proposals stated in the Introduction & Background section of this report (Section 2) and should not be used in any other context.

Darwin Ecology Ltd have endeavoured to identify the likely presence / absence of protected species wherever possible on site, where this falls within the agreed scope of works. Current standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility can be accepted where these methodologies fail to identify all species or significant species on site.

Extended Phase 1 and Preliminary Ecological survey techniques provide a preliminary assessment of the likelihood of protected species occurring on the development site, based on the suitability of the habitats and any field signs found during the site visit. A Phase 1 survey should not be taken as providing a full and definitive survey of any protected species group.

Extended Phase 1 and Preliminary Ecological Appraisals represent a snapshot of conditions at the time of survey and are limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. Surveys should therefore not be considered a comprehensive list of all plant species or as conclusive proof that certain protected species are not present or will not be present in the future.

Where the presence/absence of a certain species is in question our ecologists must apply a precautionary approach until further survey data can be sought to better inform the decision.

Darwin Ecology Ltd will advise on the optimum survey season for a particular habitat or protected species prior to undertaking the survey work. Darwin Ecology Ltd cannot accept responsibility for the accuracy of surveys undertaken outside this period.

The potential impacts, mitigation and enhancement sections of the report provide an overview and is for guidance only. This section should not be solely relied upon, but should be considered in the context of the whole report.

Interpretations of survey results and recommendations outlined in the report represent our professional opinions, expressed in accordance with recognised industry practices and current legislation at the time of reporting. The results of survey work undertaken by Darwin Ecology Ltd are representative at the time of surveying.

Where the client had supplied us with data from previous reports, it has been assumed that this information is valid. No responsibility can be accepted by Darwin Ecology Ltd for inaccuracies within any previous data supplied.

The copyright in this report, plans and other associated documents prepared by Darwin Ecology Ltd is owned by them and no such report, plans and other associated documents may be reproduced without their written consent.

Amendments to this report after its submission may be necessary in light of new, relevant information and / or legislation. This report should be referred to us for re-assessment if any such amendments are necessary or after the expiry of one year from the date of the report.



THE IMPACT OF LIGHTING ON BATS

Bats favour a dark environment for both roosting and foraging as they are adapted to low-light conditions. Artificial lighting will disturb bats if the lighting covers roost access points, flight paths or foraging habitats.

The main peak of nocturnal insect abundance occurs at dusk and a delay in emergence results in a lower foraging rate for bats.

Artificial lighting creates a 'vacuum effect' for nocturnal insects. During the night nocturnal insects use the light of the moon* to navigate. However, artificial lighting and even sky glow above cities obscures the natural moonlight as it is closer

and radiates light in multiple directions.

Some species of bats have been recorded foraging around street lights such as Pipistrelle species and Nyctalus species. However, species that are less tolerant of artificial light are at a disadvantage when foraging as insects are drawn away from these species usual foraging grounds into the zones of artificial light.

Lighting must be considered in context to any development as increased lighting may cause roost abandonment, reduced reproductive success, and reduced foraging. Mitigation to reduce the impacts of lighting for bats is therefore of great importance in bat conservation.

Table 1: Summary of predicted impact of lighting for each species/genus

Impact	High	Medium	Low
Behaviour			
Maternity roost	All species	-	-
Night roost	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>	-
Emergence	All species	-	-
Foraging	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	-	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>
Commuting	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	-	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>
Swarming	All species	-	-
Hibernation	All species	-	-

*For more information see Warrant, E., and Dacke, M. (2016) Visual Navigation in Nocturnal insects. *Physiology*, 31, 182-196.

Sources of light that can disturb bats include; light spill via windows, sport floodlighting, car headlights, roadside lighting, security lighting, aesthetic lighting of waterways, and aesthetic illumination of buildings. Glare will affect bats over greater distance than the target area directly illuminated.

Avoidance is the most effective method, but if this is not possible the following measures should be considered.

What lighting should I use?

- Low pressure sodium lights or 'warm' LEDs
- Wavelength above 540nm
- Colour temperature below 2700K
- Shielded lights that prevent light spill above a 70 degree angle
- Passive infrared (PIR) motion sensors



What to avoid:

- Lighting roost entrances, flightpaths, and foraging or commuting routes
- Reflective surfaces beneath lighting
- High level lights
- Non-directional lighting

Lighting should be considered at an early stage allowing impacts to be minimised through the design of the site.

Key Points

- Keep lighting intensity to the minimum level required
- Limit the times that lights are on to provide some dark periods (e.g. switching installations off between midnight and 5am)
- Dim lighting according to demand
- As an alternative to lighting pathways use paving materials that reflect moonlight
- Low level lighting allows darkness to be retained within higher vegetation
- Set dark habitat buffers - lighting should always be a minimum of 25m from vegetated margins and 40m from waterbodies
- Incorporate dark corridors within the site
- Compensate for the loss of dark areas by enhancing other dark areas
- Consider building design - install internal lighting away from windows