



DARWIN ECOLOGY
integrating nature conservation

Unit 6, The Wincombe Centre,
Wincombe Business Park, Shaftesbury,
SP7 9QJ

Email: info@darwin-ecology.co.uk
www.darwin-ecology.co.uk

Preliminary Ecological Appraisal Report

Kadampa Meditation Centre
Bath Road
Reading
RG1 6HH

November 2020

Darwin Ecology Ltd
Registered Office: 8 Layton Lane, Shaftesbury, Dorset SP7 8EY
Company No. 07654823

1. EXECUTIVE SUMMARY	4
2. INTRODUCTION & BACKGROUND	6
Site Overview	6
3. LEGISLATION & POLICY	8
Relevant Legislation	8
Relevant Policy	8
4. METHODOLOGY	10
Desk Study	10
Preliminary Ecological Appraisal	10
Preliminary Roost Assessment	12
5. SURVEY RESULTS	13
6. IMPACTS AND MITIGATION	19
7. ENHANCEMENT RECOMMENDATIONS	23
8. REFERENCES	25
APPENDICES	26

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.		
Prepared by	Assistant Ecologist Jessie Forster BSc (Hons)	20/11/2020
Checked by	Ecologist Mariko Whyte MSc MSc	23/11/2020
This report remains valid for 12 months from date of issue. Survey data are valid for 12-24 months from the date the survey was undertaken.		

Copyright Darwin Ecology Ltd.

This report is intended for the commissioning party only and should not be copied or reproduced in any way without prior written permission from Darwin Ecology Ltd.

This report has been prepared for the sole use of the client. Any third party referring to this report or relying on the information contained herein, does so entirely at their own risk.

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 conducted a Preliminary Ecological Appraisal at Kadampa Meditation Centre, Bath Road, Reading, RG1 6HH on 29th October 2020. The survey was required to support a planning application for the construction of a single storey extension to provide a new meditation space.
- 1.2. The site is located on Bath Road in the centre of the city of Reading in Berkshire in a surrounding landscape of urban residential and business developments. The site comprises a large brick building with associated car park to the north and well maintained garden to the south, with habitats including amenity grassland, mature trees and ornamental planting. Two small air-raid shelter buildings within the garden and a small porch on the southern elevation of the main building roofed with clay tiles are due to be demolished under the proposed plans.
- 1.3. The habitats present on site are generally of limited ecological value, with the mature trees providing the greatest habitat value on site, providing potential breeding, resting and foraging opportunities for birds and bats. A brick wall with a single access point surrounds the garden which reduces the permeability of the site and is likely to prevent wildlife access to the site at these boundaries. A single hazel tree will be removed as part of the works which provides potential roosting opportunities for bats.
- 1.4. General site mitigation measures during construction will include the protection of retained trees, sensitive vegetation clearance and ensuring that any ground works required for levelling do not result in unsupervised excavations left over night. Should such excavations be created, escape ramps will be provided to ensure that wildlife does not become trapped and excavations will be checked prior to infilling.
- 1.5. The potential bat roost features within the hazel tree to be removed are of low suitability for roosting bats therefore no further surveys are required, however, as a precautionary measure these features should be inspected immediately prior to felling by a suitably qualified ecologist. In the unlikely event that a bat roost is discovered, the removal of the hazel tree will need to be carried out under a European Protected Species Licence.
- 1.6. Works impacting the buildings on site are not anticipated to result in an offence under the European Protected Species Act, however, as a precautionary measure it is recommended that the demolition of the current porch is carried out under ecological supervision and that the two air raid shelters are subject to an internal inspection by a suitably qualified ecologist directly prior to commencement of the works. In addition, a bat sensitive lighting scheme is also recommended.
- 1.7. Recommended enhancements include the instillation of two bat boxes and one bird nesting box on suitable mature trees on site and the incorporation of two bee bricks into the new extension to provide additional roosting and nesting opportunities for species in the local area. Opportunities to further enhance the site for wildlife include the provision of access

gaps in the boundary wall to allow hedgehogs and other wildlife to move through the garden and a wildlife friendly landscaping scheme.

2. INTRODUCTION & BACKGROUND

- 2.1. This report provides the results of a Preliminary Ecological Appraisal (PEA) at Kadampa Meditation Centre, Bath Road, Reading, RG1 6HH on 29th October 2020. The survey was required to support a planning application for the construction of a single storey extension to provide a new meditation space.
- 2.2. The PEA survey and report follow the Chartered Institute for Ecological and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal (2017), which sets out the approach for PEAs to provide a rapid assessment of the ecological features present, or potentially present, within a site and its surrounding area, which comprises the zone of influence for each specific project.

Site Overview

- 2.3. The site is located on Bath Road in the centre of the city of Reading in Berkshire. The surrounding landscape comprises urban residential and business developments (see Figure 1).
- 2.4. The wider landscape comprises continued residential development, with a number of areas of priority habitat in the local area. These include an area of floodplain grazing marsh approximately 800 m to the south and an area of wood pasture, parkland and deciduous woodland approximately 1.5 km to the west. Further small areas of wood pasture and parkland, deciduous woodland, and ancient woodland are present scattered throughout the urban area. The Kennet and Avon Canal runs north to south approximately 750 m east of the site, branching from the River Thames which runs west to east approximately 1.9 km north of the site (see Figure 2).
- 2.5. The site itself comprises a large brick building with associated car park to the north and well maintained garden to the south comprising amenity grassland, mature trees, ornamental planting and two small air-raid shelters. The garden is surrounded by a tall brick built wall, with iron gates at the southwest corner (see Figure 3).



Figure 1: Site location (Copyright Google Maps 2020)



Figure 2: Site location within the wider landscape (Copyright Google Maps 2020)

3. LEGISLATION & POLICY

- 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 these 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 legislation and policy that triggers the requirement for PEA and further ecological assessments in the UK. The presence of protected species within a site are a material consideration during the planning process. PEAs 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).

Relevant Legislation

- 3.4. The principal pieces of legislation relating to wildlife and of relevance to this report are:
1. *EU Habitats Directive (1992)*;
 2. *EU Birds Directive (1979)*;
 3. *Conservation of Habitats and Species (Amendment) Regulations 2012*;
 4. *The Wildlife and Countryside Act 1981 (as amended)*;
 5. *The Natural Environment and Rural Communities Act 2006*; and
 6. *The Protection of Badgers Act 1992 (extended under The Hunting Act 2004)*.
- 3.5. The above legislation aims to protect sites and species and give detailed descriptions of exactly how these features are protected and what actions would constitute an offence.

Relevant Policy

- 3.6. Local planning authorities are obliged to follow key principles to ensure that the potential impacts of planning decisions on biodiversity are fully considered.
- 3.7. The *National Planning Policy Framework (Feb 2019)* 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. To comply with the *National Planning Policy Framework* in relation to biodiversity, local policies and decisions should contribute to and enhance the natural environment by:

170 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);

170 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;

174 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;

175 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; and

175 d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

- 3.8. *Circular 06/05: Biodiversity and Geological Conservation* provides guidance on the application of the law relating to planning and nature conservation and complements the *National Planning Policy Framework*.
- 3.9. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* provides the *UK Biodiversity Action Plan* and country level biodiversity strategies for England, based on the list of habitats and species listed on *Section 41* of the *Natural Environment and Rural Communities Act 2006*. These are considered the habitats and species of principal importance requiring conservation action.
- 3.10. The *Reading Borough Local Plan*, adopted in 2019 sets out the requirements for preserving biodiversity and the local 'Green Network' through the planning process within Policy EN12. This requires developments to maintain or create new connections to the existing Green Network through appropriate landscaping and green space creation and for all development to provide demonstrable net gain for biodiversity where possible.
- 3.11. The *Reading Biodiversity Action Plan* was written in 2006 and ran until 2015. A new Biodiversity Action Plan is currently being reviewed and is anticipated to be finalised in the near future having been subject to consultation during 2020. This Local Biodiversity Action Plan aims to ensure that Reading's biodiversity is protected and declines in biodiversity are reversed, with important wildlife sites and habitats being restored, extended and enhanced and new habitats created. As part of this, the draft Reading BAP 2020 includes commitments to ensure that new developments result in measurable net gain for biodiversity, which will be recorded and monitored.

4. METHODOLOGY

Desk Study

- 4.1. A desk study was undertaken for designated sites and protected species and habitat records within 2 km of the site. The following resources were consulted:
- A data search was conducted by the Thames Valley Environmental Records Centre (TVERC) for protected species records and local sites within 1 km of the site and bat species records within 2 km of the site;
 - The MAGIC Map website, which provides information on any designated sites of nature conservation interest within 2 km of the site and details of any European Protected Species (EPS) licences issued within 2 km; and
 - Google Maps, which provides aerial photographs and maps to assess the ecological context of the site.

Preliminary Ecological Appraisal

- 4.2. Ecologist Mariko Whyte MSc and Assistant Ecologist Jessie Forster BSc (Hons) conducted a PEA on the 29th October 2020.
- 4.3. The PEA survey identified habitats present within the application red line boundary (and directly adjacent) and their potential for protected species, including:
- Bats;
 - Common amphibians;
 - Reptiles;
 - Dormice *Muscardinus avellanarius*;
 - Terrestrial mammals, including hedgehogs *Erinaceus europaeus* and badgers *Meles meles*; and
 - Birds
- 4.4. A search for water bodies within relevant proximity to the site was conducted using MAGIC Map and the Ordnance Survey (OS) standard and leisure maps. No water bodies within 500 m of the site boundary were identified and there are no water bodies (suitable or otherwise) within the site boundary itself. There are no EPS licenses registered for great crested newts *Triturus cristatus*, or positive results of pond surveys (2017 - 2019), within 2 km of the site. Two ponds within 2 km of the site were surveyed between 2017 and 2019 and returned a negative result for great crested newts. As such, the potential for great crested newts to be present and using any suitable terrestrial habitat within the site (which is itself relatively limited) is negligible and they are not considered further in this report.

4.5. The site was also searched for non-native, invasive plant species, with particular care to search for the most commonly occurring and problematic species such as Japanese knotweed *Fallopia japonica*, Indian balsam *Impatiens glandulifera* and giant hogweed *Heracleum mantegazzianum*.

4.6. Trees and other habitat immediately adjacent to the site, both within and outside of the wider ownership boundary, were also assessed for their potential to support protected species.

Bats

4.7. Any trees that could be impacted by the proposed works were assessed for Potential Roost Features (PRFs), which increase the likelihood of bats roosting, such as storm damage, rot holes, ivy cover, flaying bark and splits in the trunk.

4.8. Linear habitat features, both within and adjacent to the site, were assessed for their likely use as foraging and commuting corridors. Habitats within the site were also assessed for their likely use as foraging sites.

Amphibians

4.9. There are no water bodies within the site boundary or the surrounding local area. Terrestrial habitat within the site was assessed for its potential to be used outside of the breeding season for foraging, sheltering and hibernating by common amphibians.

Reptiles

4.10. Habitat suitability for reptiles was assessed and the presence of features which increase the potential for the site to be used by reptiles (such as tussocky vegetation, log and rock piles, basking spots and compost heaps) was recorded.

Dormice

4.11. Habitat suitability for dormice was assessed and the presence of features that increase the potential for the site to be used by dormice, such as species-rich hedgerows, presence of hazel *Corylus avellana* or honeysuckle *Lonicera* species and intact tree lines or hedgerows with continuous connected canopies or vegetation, was recorded.

Terrestrial Mammals

4.12. Areas of dense vegetated cover on site and adjacent to the site were assessed for their likely use by badgers, including looking for signs of current or historic badger activity such as setts, push throughs and mammal tracks.

4.13. Open areas of habitat were assessed for signs of mammal tracks, latrines and snuffle holes.

Preliminary Roost Assessment

- 4.14. Mariko Whyte MSc¹ and Jessie Forster BSc, carried out a preliminary roost assessment (PRA) of the buildings on site to be impacted by the proposed works in accordance with the following methodology.

Internal Survey:

- 4.15. An investigation was carried out of all roof and wall features for signs of bats roosting and the access potential of the roof 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.

External Survey:

- 4.16. An investigation was carried out of features that may indicate bat presence. For example; gaps under roof and ridge tiles, or behind soffit boards and wooden fascias. A search for bat droppings was made beneath each potential entry/exit point identified. The surveyor used binoculars, a powerful, low heat LED torch and a ladder to closely inspect gaps beneath tiles.

¹ 2020-44879-CLS-CLS

5. SURVEY RESULTS

Desk Study

Statutory Designated Sites

- 5.1. No statutory designated sites are located within 2 km of the proposed development site. The nearest is Lousehill Copse, a local nature reserve (LNR) supporting an area of semi-ancient woodland, located approximately 2.2 km west of the site

Berkshire Local Wildlife Sites

Site name	Reason for designation	Approximate distance from site
Kennet valley east and the River Kennet	An important chalk river and associated fen, scrub and woodland habitat.	750 m east
Holy Brook	The Holy Brook is a stream that carries water from and emptying back into the River Kennet, a chalk river.	800 m south
Fobney and Kennet Valley Meadows	A large area of permanent pasture with some wet grassland and patches of swamp vegetation. The site has a good series of ditches with tall wetland and aquatic species and a small area of woodland.	800 m south
Cow Lane Depot	A small site comprising a mosaic of habitats ranging from willow scrub with mature trees, to open standing water with swamp to ruderal and tall herb grassland.	1 km north

Priority Habitats and Ancient Woodland

- 5.2. No areas of priority habitat are present within or directly adjacent to the site. There are a number of areas of priority habitat within 2 km of the site, including deciduous woodland, floodplain grazing marsh and wood pasture and parkland. The closest area of priority habitat is a large area of floodplain and grazing marsh approximately 800 m south of the site.
- 5.3. The nearest area of ancient woodland is Lousehill Copse approximately 2.2 km east of the site.

Priority and protected species

- 5.4. Details of priority and protected species records in the local area are included within the protected species sections of the PEA results below.

Preliminary Ecological Appraisal

Overview

- 5.5. The site comprises a large building set on hardstanding, a car park with surrounding mature trees and shrubs is present to the north of the building, and a garden with areas of amenity grassland, ornamental planting and further mature trees is present to the south of the building. Two small air-raid shelters are present within the garden to the south of the main building. The works will only impact the garden directly to the south of the building,



Image 1: Main building, with hazel tree and air-raid shelters to be removed



Image 2: Garden to the south of the main building

Habitats

Hardstanding

- 5.6. The area to the north of the building comprises hardstanding composed of tarmac and paving of negligible ecological value. A small area of hardstanding is present to the south and west of the main building.

Amenity Grassland

- 5.7. Much of the garden comprises well maintained amenity grassland (Figure 3). The sward is kept very short and there is little diversity. Species present include perennial ryegrass *Lolium perenne*, common cat's-ear *Hypochaeris radicata*, dandelion *Taraxacum agg.*, rough hawkbit *Leontodon hispidus* and mind-your-own-business *Soleirolia soleirolii*.

Ornamental Planting

- 5.8. Several small areas of ornamental planting consisting of shrubs and flowerbeds are present within the garden, primarily along the boundaries of the site and surrounding the trees, all of little ecological value.
- 5.9. A border of shrubs and trees runs adjacent to the car park to the north of the building. This area is not anticipated to be impacted by the works.



Image 3: Well managed amenity grassland at the site of the proposed extension



Image 4: Grassland and ornamental planting at the southern boundary of the garden

Trees

- 5.10. Several mature trees are present around the edges of the garden, species present include hazel *Corylus avellana*, walnut *Juglans regia*, holly *Ilex aquifolium*, yew *Taxus baccata*, sweet chestnut *Castanea sativa* and chanticleer pear *Pyrus calleryana*.
- 5.11. A tree survey has been conducted and the plans for the extension have been designed in order to have as little impact on the existing trees as possible. It is anticipated that the Hazel at the western border is the only tree to be removed during the works. This tree was observed to have several potential bat features, as detailed below.



Image 5: Sweet chestnut tree in the centre of the garden



Image 6: Hazel tree with potential bat roost features

Other features

- 5.12. A series of compost heaps and small brash piles were present at the southern end of the site, providing potential shelter and foraging opportunities for wildlife. In addition, many of

the borders were edged with natural logs and a large tree stump is present adjacent to the hedgerow at the northern boundary of the site.

Species

Bats

- 5.13. There are 20 records of EPS licences required for works affecting bat roosts within 5 km of the site at Kadampa Meditation Centre within the last 5 years. Species affected include common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus* and Daubenton's *Myotis daubentonii*. The records centre data search identified records for the above species and also noctule *Nyctalus noctula*, serotine *Eptesicus serotinus* and Nathusius' pipistrelle *Pipistrellus nathusii* within 2 km of the site.
- 5.14. The mature trees at the western and southern boundaries of the site provide moderate foraging and commuting opportunities for bat species. A multi-stemmed hazel and a walnut tree on site contain features with low suitability for roosting bats. No other trees in the garden to the south of the building were assessed to be suitable for roosting bats.
- 5.15. The features on the hazel tree comprise two small gaps between stem unions located approximately 2.5 m and 5 m high (see Figure 3), and one small branch tear located approximately 8 m from the ground. All three features appeared shallow and exposed with low potential to be used opportunistically by individual bats and were therefore assessed to be of low suitability for roosting bats.
- 5.16. The features on the walnut tree comprise two rot hole cavities approximately 4 m high. Both these cavities appeared to be shallow and one cavity was observed to have a downward facing entrance, reducing the suitability for roosting bats. Both cavities were considered to have low potential to be used opportunistically by a single bat and were therefore assessed to be of low suitability. In addition, a light covering of ivy was present with negligible potential for roosting bats.
- 5.17. The two air-raid shelter buildings and the rear porch on the main house to be impacted by the proposed works were assessed for potential for roosting bats.
- 5.18. The porch had a number of lifted tiles which may provide suitable roosting opportunities for crevice dwelling bats in the space between the tiles and the wooden lining of the porch. As no other features will be impacted by the proposals, and all the features present were accessible and able to be fully inspected, a detailed internal inspection of these features was undertaken from a ladder using a high power LED torch. No evidence of current or historical use by bats was found and it is considered that this structure is not used by roosting bats.
- 5.19. The two air-raid shelter buildings are brick built with flat concrete roofs. No features suitable for crevice roosting bats are present externally. Internal access is present through the open

doorways, however, no evidence of bats was identified. Both buildings were assessed to have negligible potential for roosting bats.

- 5.20. The main building was also surveyed internally and externally and was identified to have high potential for roosting bats due to numerous external features such as lifted and missing tiles on the roof. The roof space is fully converted and no evidence of bat presence was found internally.



Image 7: Clay tiled porch roof



Image 8: Interior of air-raid shelter building

Amphibians

- 5.21. No records were returned for amphibians within 1 km of the application site.
- 5.22. The majority of the site is unsuitable for amphibians, comprising mainly of hardstanding and short, well managed amenity grassland. The compost heaps and brash piles at the southern boundary and logs at the edges of the borders provide the most suitable refuge and foraging areas for common amphibian species, however, the high brick walls and the location of the site within an urban area ensure there is little connectivity to suitable surrounding habitats.

Reptiles

- 5.23. Eight records of slow worm *Anguis fragilis* were returned within 1 km of the site.
- 5.24. As above, the majority of habitat within the site is unsuitable or of limited suitability for reptiles. Due to the presence of mature trees and high walls, the site is very shaded and isolated with little suitable surrounding habitat.

Dormice

- 5.25. There are no records of EPS licenses required for works affecting dormouse *Muscardinus avellanarius* habitat within 1 km of the application site. No records of dormice were returned within 1 km of the site.
- 5.26. The habitats on site are unsuitable for dormice, not providing the structure and connectivity this species requires. This species is not considered further in this report.

Terrestrial Mammals

- 5.27. Six records of hedgehogs *Erinaceus europaeus* were returned within 1 km of the application site, no records for any other terrestrial mammal species were returned.
- 5.28. The habitats on site, provide poor opportunities for foraging and shelter for hedgehogs and other mammals. The garden to the south of the main building is walled on all boundaries, which is likely to prevent access to the site by larger species including hedgehogs and other larger mammals. A single access point is present at the southwestern corner, however, the presence of a relatively busy road directly adjacent to the application site provides a landscape barrier to terrestrial species and the site is poorly connected to suitable habitat in the local area.

Birds

- 5.29. There are numerous records of birds which are legally protected or priority or notable species within 1 km of the site. Species that may use the habitats on site or pass through the site include starling *Sturnus vulgaris* , stock dove *Columba oenas* and peregrine *Falco peregrinus*.
- 5.30. Other common garden bird species are likely to use the trees on site for nesting and foraging.



Potential bat roost feature:





	Application site boundary		Amenity grassland
	Brick wall		Ornamental planting
	Open wooden fence		Hardstanding
	Iron gate		Building
	Tree		Target note
	Hedgerow		

Target Notes

- TN1 Hazel tree with potential bat features
- TN2 Walnut tree with potential bat features
- TN3 Tree stump
- TN4 Brash piles / compost heaps

6. IMPACTS AND MITIGATION

Desk Study

Statutory Designated Sites, Priority Habitats and Ancient Woodland

- 6.1. As the usage of the site will not change, no negative impacts on statutory designated sites, priority habitats or ancient woodland are anticipated. Precautionary mitigation measures and protocols during construction will ensure that all impacts are avoided entirely.

Habitats

- 6.2. The majority of the site holds little intrinsic ecological value, with higher ecological value provided by the mature trees on site.
- 6.3. The current proposals comprise demolition of the air-raid shelter buildings B2 and B3 (see Figure 3) to the south of the main building to construct a single storey extension in the garden to the south of the main building. Small areas of low value grassland and ornamental planting will be lost. The hazel tree on site will be removed, however, the other mature trees on site will be retained and not impacted by the works. The extension has been designed with a floating pedestal foundation to avoid impacts to the root protection areas of the retained trees on site.
- 6.4. It is considered that the small amount of low value habitat to be lost under the proposals will not result in a significant impact on populations of protected species and other wildlife in the local area provided the mitigation measures below are followed.

General Site Mitigation of Construction Phase Impacts

- 6.5. These mitigation measures are recommended to ensure that specific habitat features of ecological value are not damaged during the landscaping works.
- 6.6. *Trees and hedgerows:* Suitable protective buffers will be implemented around the wooded area, taking into account Root Protection Areas, to ensure that potentially damaging activities (such as tracking of heavy plant across the site) do not have a negative impact on these ecologically valuable features.
- 6.7. *Vegetation clearance:* To avoid impacts on amphibians, reptiles, hedgehogs, birds and other mammals, where any areas of shrub vegetation are removed, this should be undertaken by hand in a sensitive manner to avoid killing or injuring individuals that may be present. Any animals found during works will be carefully moved to an area of suitable habitat away from the construction area.
- 6.8. *Excavations:* During the works, any trenches or excavations must be covered overnight, or provided with a ramp, to allow any animals to escape if they should fall in. All excavations should be investigated immediately prior to infilling to ensure that no animals are trapped.

Protected Species

Bats

Impacts on buildings

- 6.9. The rear porch on the main building and the two air-raid shelter buildings will be directly impacted by the works. No evidence of roosting bats was identified during a high level inspection of the porch roof or within the air-raid shelter buildings.
- 6.10. The main house itself has a high potential to support roosting bats. It will not be impacted by the proposed works and the construction of the single storey extension is not anticipated to have a significant impact on commuting and foraging habitat for bats on site. The majority of mature trees and the continuous tree line at the eastern boundary of the site will all be retained following the proposed works.
- 6.11. The proposals are therefore not anticipated to result in an offence under the European Protected Species Act provided the following mitigation measures are followed.
- 6.12. If any future works are anticipated which may impact the main building, further surveys are likely to be required.

Mitigation

- 6.13. The porch roof is considered to have low potential for roosting bats, therefore as a precautionary measure it is recommended that destructive works for this section are carried out by hand, under ecological supervision.
- 6.14. The two air-raid shelters have negligible potential for roosting bats, however, it is recommended that an internal inspection is carried out by a suitably qualified ecologist immediately prior to commencement of destructive works.
- 6.15. Any new external lighting must be directed to avoid light spillage onto vegetation, particularly linear habitat features such as tree lines or potential roosting sites within trees and buildings. Bats are sensitive to light and could potentially avoid the area if access points or the surrounding areas become lit. Appropriate lighting options will prevent a negative impact on bats potentially using the habitats on site and should be approved by a suitably qualified and licensed bat ecologist.
- 6.16. Minimising the periods of lighting and using motion sensors are 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 much better than bright white LEDs.

- 6.17. If appropriate measures are taken to reduce light spillage from the development, it is likely that there will be no negative impacts on local bat populations.

Impacts on trees

- 6.18. The hazel tree to the west of the air-raid shelters will be removed as part of the proposed works. Several features of low suitability for roosting bats were identified within this tree.
- 6.19. The proposals are not anticipated to impact the other mature trees or result in the loss of significant foraging or commuting opportunities for bats within the local area.

Mitigation

- 6.20. No further surveys are required, however, as a precautionary measure the features identified on the tree being removed should be inspected immediately prior to felling by a suitably qualified ecologist. In the unlikely event that a bat roost is discovered, the removal of the hazel tree will need to be carried out under a European Protected Species Licence.

Common amphibians and reptiles

- 6.21. Due to the limited amount of suitable habitat for amphibians and reptiles within the site, no impacts on amphibian species are anticipated.
- 6.22. The general site mitigation measures detailed above are considered sufficient to protect any amphibians and reptiles that may be present on site during construction work.

Terrestrial Mammals

- 6.23. There is potential for hedgehogs to be present on site although they are unlikely to commute or forage regularly within the site due to the walls surrounding the majority of the site and the location on a busy road. It is unlikely that any other species are present or using the site due to the limited suitable habitat available and the impermeability of the site.
- 6.24. Gardens and green spaces in urban areas can support high densities of hedgehogs and creation of hedgehog highways and connecting habitats is essential for increasing the resilience of these populations. Should any fencing be installed in the future, access holes suitable for hedgehogs (13 cm x 13 cm is considered sufficient) should be incorporated to ensure that permeability through the site is enhanced for this species.
- 6.25. The general site mitigation measures detailed above are considered sufficient to protect terrestrial mammals during construction works.

Birds

- 6.26. There is suitable habitat for nesting birds within the trees on site, ornamental shrub planting also provides limited opportunities for nesting birds. The majority of the trees and ornamental planting will not be impacted by the works but the hazel tree and adjacent areas of ornamental planting will be removed.
- 6.27. All occupied birds nests have legal protection from damage and destruction under the Wildlife & Countryside Act (1981). All clearance of suitable vegetation and trees should therefore be undertaken outside of the nesting bird season (March to September inclusive for most species in the UK). If vegetation clearance must be undertaken during the nesting season, all vegetation should first be subject to a breeding bird survey by a suitably qualified ecologist. If any active bird nests are found in the areas that need to be cleared the chicks must first be allowed to fledge.

7. ENHANCEMENT RECOMMENDATIONS

- 7.1. The *National Planning Policy Framework* states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not.

Bat boxes

- 7.2. Two bat boxes, suitable for the species recorded in the local area should be installed on suitable retained trees on site. Suitable boxes for common crevice or cavity dwelling species such as common and soprano pipistrelle and brown long-eared bats include the Schwegler 2F bat box with double front panel or a Bark Boxes large twin crevice bat box (see External Bat Boxes factsheet in Appendix 4). These will provide additional roosting opportunities for a range of bat species within the site.
- 7.3. The locations will be determined by a licensed bat ecologist to ensure likelihood of repeated use is increased. The bat boxes will be installed at a height of at least 4 m, preferably on a southern un-cluttered aspect with good connectivity to linear features such as other mature trees and hedgerows.

Bird Boxes and Bee Bricks

- 7.4. The installation of bird boxes at suitable locations on the trees or buildings on site can provide additional nesting opportunities within the site (see Bird Boxes factsheet in Appendix 4). Advice for locating these should be sought from a suitably qualified ecologist to ensure that they are placed in appropriate locations to maximise uptake. It is recommended that 1 x WoodStone nest box should be installed on a suitable tree within the garden to enhance the site for bird species the local area (see Figure 4).
- 7.5. To enhance the site for invertebrates, it is recommended that 2 x Bee Bricks should be integrated within the proposed extension building on site (see Figure 4). These should be located in a sunny south-facing location, at least 1 m above ground level.

Permeability and connectivity of the site

- 7.6. Access opportunities for hedgehogs could be created by removing bricks from the base of the boundary wall. A gap of 13 cm by 13 cm is sufficient to ensure hedgehogs and other smaller animals such as reptiles and amphibians can freely access/exit the site.

Wildlife Beneficial Landscaping Scheme

- 7.7. Any future landscaping planting should seek to enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of wildlife. All ornamental planting and formal landscaped areas should be designed using a variety 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. Non-invasive species should be planted. 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.

- 7.8. Pond creation is a simple way to instantly enhance sites for wildlife if appropriate. A pond will provide a water source for birds, hedgehogs, bats, invertebrates and other species that may use the site. A pond can be any size and should be planted with native aquatic and marginal plants. To be of benefit to wildlife, ponds should not be stocked with fish.
- 7.9. If a pond is not possible for safety reasons or space restrictions, any water source such as a bird bath or small pool will also provide an enhancement for wildlife.
- 7.10. All habitats should be managed in a suitable way to encourage a wide variety of insects and other wildlife to use the site.

8. REFERENCES

Collins, J. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition)* The Bat Conservation Trust, London.

Bright, P., Morris, P. and Mitchell-Jones, T. (2006). *The Dormouse Conservation Handbook*. English Nature.

British Hedgehog Preservation Society & People's Trust for Endangered Species (2018). *Hedgehog ecology and land management*.

CIEEM (2012) Guidelines for Preliminary Ecological Appraisal. *Technical Guidance Series*.

DEFRA (2014) *The National Pollinator Strategy: for bees and other pollinators in England*.

Edgar, P., Foster, J. and Baker, J. (2010). *Reptile Habitat Management Handbook*. Amphibian and Reptile Conservation, Bournemouth.

Hedgehog Street website. <https://www.hedgehogstreet.org>

JNCC (2010), *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit*. JNCC, Peterborough.

Mitchell-Jones, A.J., (2004). *Bat Mitigation Guidelines*. English Nature, Peterborough.

Mitchell-Jones, A. J. & McLeish, A. P. (2004). *Bat Workers' Manual (3rd Edition)*. JNCC, Peterborough.

Natural England (2011). *Reptile Mitigation Guidelines*. Natural England.

Schofield, H. W. & Mitchell-Jones, A.J. (2004). *The Bats of Britain and Ireland*. Vincent Wildlife Trust, Ledbury.

Wembridge, D. (2011). *The State of Britain's Hedgehogs*. British Hedgehog Preservation Society and Peoples Trust for Endangered Species.

UK Government's Countryside Geographic Information Website [online]
www.magic.gov.uk [Oct 2020].

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 is 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 *Pipistrellus* 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	-	-

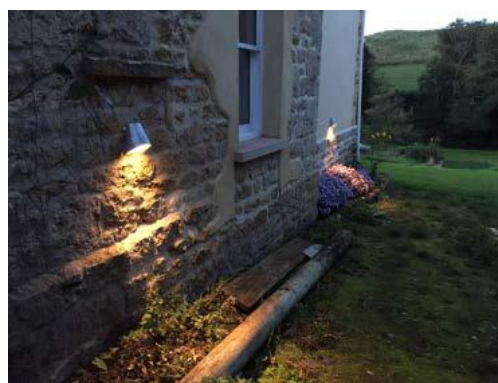
*For more information see Warrant, E., and Dacke, M. (2016) Visual Navigation in Nocturnal insects. *Physiology*, 31, 182-196.

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



TYPES OF BAT BOXES



Schwegler 2F Double Front Panel

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle and Myotis species
- A second inner wooden panel is fitted adjacent to the front panel imitating a cavity wall



Schwegler 1FD Double Front Panel

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle and Myotis species
- A second inner wooden panel is fitted adjacent to the front panel imitating a cavity wall
- Small entrance hole discourages birds from using the box



Vincent Pro Bat Box

- Manufactured from timber and recycled plastic
- The front and the top of the box is black, which helps heat absorption
- Suitable for a range of species including pipistrelle species, Myotis species, and brown long-eared bats.
- No maintenance required



Schwegler 2FN

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle species, Myotis species, serotine, brown long-eared, noctule and Leisler's bats
- Dual entrance
- Birds and dormice have also been found using this box
- A newer model is now available, Schwegler 3FN, designed with smaller entrance holes which discourage birds and dormice



Schwegler 1FS Large Colony Box

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for a range of bats including pipistrelle species, Myotis species, Noctule, and brown long-eared bats
- Three grooved inner wooden panels are connected to the front panel, which are ideal for bats to cling to.
- Accommodates large summer colonies



2FE Wall Mounted Bat Shelters

- Can be used in the summer if mounted on a wall facing south or east, and for winter use, install them in a location free from ice and frost such as damp cellars (paintable).
- Lifetime - 20-25 years
- Suitable for crevice roosting bats including Pipistrelle, Whiskered and Barbastelle bats.
- No maintenance required



Bark Boxes - Large Twin Crevice Bat Box

- Built to reflect natural tree features with materials that encourage moss and lichen development.
- A range of shapes are available to mimic various tree features.
- The large twin crevice bat box has two curved internal voids narrowing down to tight crevices at the top.
- Suitable for a range of bat species and has been used as a pipistrelle mating roost.
- 10 year guarantee.
- No maintenance required.



TYPES OF BIRD BOXES



Vivar Pro Seville 32mm WoodStone Nest Box

- Manufactured from woodstone - increases longevity and provides a consistent internal temperature
- The nest box compensates for the lack of natural cavities that are found in trees
- Suitable for blue tits, tree sparrows, house sparrows, great tits, crested tits, nuthatches, coal tits and pied flycatchers
- Should be installed between 1.5m and 3m high



House Martin Nest Cups



Swallow Nest Bowl

- Suitable nest building mud is difficult for house martins and swallows to find
- Alterations to house construction and roof design have resulted in a decrease of suitable nesting sites
- Install swallow nest bowls within an outbuilding or garage that has flight access - 6cm below the ceiling
- Install house martin nest cups under the eaves of a house - minimum of 2m high



Swift Nest Box

- Swift numbers are declining partly due to a loss of nesting sites
- The entrance hole discourages other birds such as starlings and sparrows
- Install a minimum of 5m high with unobstructed airspace in front of the nest
- Integrated models of swift nest boxes are also available



5KL Schwegler Nuthatch Nest Box

- Manufactured from woodcrete
- Nuthatches prefer nest boxes with larger cavities. They will often occupy owl nest boxes and fill the entrance hole with mud reducing the size to approximately 32mm
- Nuthatches plaster mud on the internal walls of the cavity and line the floor with wood chipping and leaves to nest
- To discourage nuthatches from using owl nest boxes try installing the 5KL immediately adjacent



Open-fronted Nest Box

- Manufactured from woodstone - lifetime of 20-25 years
- Suitable for robin, wren, spotted flycatchers, and black redstart
- Best installed hidden from view on the wall of a building or hidden within ivy/honeysuckle as the boxes open-front may attract predators
- Install at a height of 1-3m



Sparrow Terrace Nest Box

- Sparrow populations are decreasing due to a lack of nesting sites
- Sparrows are a sociable species and prefer to nest in a colony
- Likelihood of uptake is increased if more nesting chambers are available (the example nest box shown contains three nesting chambers)
- Various other nest box designs are available
- Install at a minimum of 2m high



Tawny Owl Nest Box

- Install on a mature tree within a woodland (not on the outskirts)
- Install a minimum of 3m high
- Face the box entrance away from prevailing wind (generally avoiding west/south-west)



Little Owl Nest Box

- Prefer areas of mixed farmland and orchards
- Essential features; small entrance hole (70mm), narrow tunnel, and a dark nesting chamber
- Install on a horizontal tree branch/wall top or beam so that owlets can walk in/out prior to fledging
- Can be installed on any tree species apart from cherry - the cherry harvest coincides with the little owl breeding season
- Entrance hole should face the tree trunk
- Install at a minimum height of 3m