

Caroline Suite, Stonehouse Court Hotel, Stonehouse

Bat Preliminary Roost Assessment Report

On behalf of Crocker House Ltd

Project Code: JM2023027Av1

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1 Introduction

1.1 Scope

1.1.1 Wild Service was commissioned by Crocker House Ltd to undertake a bat Preliminary Roost Assessment (PRA) of the Caroline Suite at Stonehouse Court Hotel, Bristol Road, Stonehouse, Gloucestershire, GL10 3RA (hereafter referred to as 'the Site'). The assessment was requested to inform proposals to renovate the existing building referred to as the Caroline Suite, including complete re-roofing and installation of solar panels.

1.1.2 The PRA comprised a detailed internal and external building inspection and the report is supported by a desk study.

1.1.2 This report presents the findings of the above survey assessment and identifies ecological constraints and opportunities. It also proposes a series of pragmatic and proportional mitigation and enhancement measures.

1.2 Site Description

1.1.2 The Caroline Suite is a single-storey building used as a venue for events. The building is located within the grounds of Stonehouse Court Hotel in Stonehouse, Gloucestershire. The building is located a few metres to the east of the Grade II listed manor hotel building. Immediately to the north, east and south are the property gardens comprising amenity grassland and scattered trees, and there is a small ornamental pond to the south-east of the building. A Location Plan is provided in Figure 1 indicating the Site boundary. The Site is access via an entrance road off Bristol Road.

1.1.2 The surrounding landscape is predominantly urban, with Bristol Road passing the Site to the north, and residential properties to the east and west of the Site. Stroudwater Canal is located approximately 95m to the south of the Site and there is a small woodland block to the south of the Caroline Suite.

1.1.2 The central Ordnance Survey Grid Reference for the Site is SO 79952 05089.

1.3 Legislation

1.1.2 This report has been prepared in accordance with relevant legislation and policy. Further detail is provided in Appendix 1, however the following primary documents are of relevance:

The Wildlife and Countryside Act 1981 (as amended) (WCA 1981);

The Countryside and Rights of Way Act (CRoW Act), 2000 (as amended);

The Natural Environment and Rural Communities Act (NERC Act), 2006; and

The Conservation of Habitats and Species Regulations 2017 (as amended) (CHS 2017).

1.1.2 No part of this report should be considered as legal advice and when dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.



Figure 1. Location plan with site boundary outlined in red
Plan provided by client

2 Methods

2.1 Desk Study

2.1.1 The objectives of the desk study are to review the existing available information to identify the following:

Statutory and non-statutory nature conservation sites within 1km of the Site (including an extended search of 5km for Special Protection Areas (SPAs), Special Areas of Conservation (SACs), and Ramsar sites); and

Records of bats within 2km of the Site.

2.1.1 Ecological data were provided by the Gloucestershire Centre for Environmental Records (GCER) and sourced from the Multi-Agency Geographic Information for the Countryside (MAGIC) website (2023).

2.2 Detailed Preliminary Roost Inspection

2.1.1 The Caroline Suite at Stonehouse Court Hotel was evaluated for bat roosting potential both internally and externally [REDACTED] on 16th August 2023, as an accredited agent under Natural England Class Level 2 bat licence ([REDACTED] NE Bat Survey Level 2: 2015-13418-CLS-CLS, WML CL18). The survey was undertaken in accordance with best practice guidelines (based on Collins, 2016).

2.1.1 The building's exterior was observed from ground level using a high-powered torch, paying attention to potential roosting and access points for bats. Internal areas were also accessed. Areas of particular suitability include crevices in stonework, gaps beneath roof tiles and any dark loft spaces. Any suitable areas were searched thoroughly for evidence of use by bats. Signs of bats include live animals, corpses, droppings, urine staining, feeding remains (e.g. moth and butterfly wings) and scratches.

2.1.1 The criteria used to categorise the bat roost potential (BRP) of buildings and trees are summarised in Table 1 (based on Collins, 2016).

Table 1. Bat Roost Potential

| Category | Description |
|--|--|
| Known or confirmed bat roost | <p>Bats or evidence of bats recorded, both of recent and/or historic activity.</p> |
| High to moderate BRP | <p>Works affecting a roost are licensable. Further survey effort (e.g. dusk emergence/dawn re-entry survey(s) in accordance with best practice) is required to determine the bat species present, nature of roost and level of use before mitigation can be determined. Seasonal constraints may apply.</p> |
| Buildings/trees with features capable of supporting a bat roost. | <p>Features include holes, cracks or crevices that extend or appear to extend back to cavities suitable for bats. In trees, examples include rot holes, woodpecker holes, splits and flaking or raised bark which could provide roosting opportunities. Any ivy cover is sufficiently well-established and matted so as to create potential crevices beneath. In buildings, features such as gaps beneath ridge and roof tiles, gaps beneath fascia and barge boards and access points into internal loft voids or cellars are all features of roosting potential for bats.</p> |
| Low BRP | <p>Further survey effort is required to determine whether or not bats are present and if so, the bat species present, nature of roost and level of use. Appropriate mitigation and potentially licensing requirements may then be determined. Seasonal constraints may apply.</p> |
| | <p>Buildings: The building may exhibit features that would have some limited bat roosting opportunities. A further survey for emerging or re-entering bats is required to help confirm the building's low suitability, or to identify any roosting bats present.</p> <p>Trees: From the ground, the tree appears to have features (e.g. holes, cavities or cracks) that may extend back into a cavity. However, owing to the characteristics of the feature, they are deemed to be sub-optimal for roosting bats. Alternatively, if no features are visible but owing to the size and age and structure, hidden features, sub-optimal for roosting bats, may occur that only an elevated inspection may reveal.</p> <p>For trees, no further survey is required. Works may proceed using reasonable precautions (e.g. controlled working methods, usually the soft-felling of a tree under supervision of a bat worker. Seasonal constraints may apply).</p> |
| Negligible | <p>An inspected building or tree that is considered not to have potential for roosting bats. No further survey or mitigation required.</p> |

2.3 Limitations and Constraints

2.1.1 While every attempt has been made to collect accurate baseline data, all ecological surveys represent a 'snapshot' of activity. Ecological features are dynamic and often transient, and it is not possible to confirm the absence of a species through survey. It may be necessary to update the ecological surveys if sufficient time elapses since the surveys and data collection presented in this report were carried out.

2.1.1 The internal loft was accessed via a small storage room on the ground floor. Due to health and safety concerns, only the area immediately surrounding the loft hatch was accessed. Most of the loft walls and roof were visible from the area immediately above the loft hatch, but a full inspection of the loft was not possible. As such, if any evidence of presence of roosting bats (e.g. bat droppings) were present on the parts of the loft floor which were inaccessible, these would not have been recorded during the PRA survey.

3 Results

3.1 Desk Study

Statutory Nature Conservation Sites

2.1.1 There are no statutory nature conservation sites within 1km of the Site.

Non-Statutory Nature Conservation Sites

2.1.1 There are five non-statutory nature conservation sites within 1km of the Site, all of which are designated as a Local Wildlife Site (LWS). The site name, reason for site selection and approximate distance from the proposed development Site are provided in the table below.

| Site name | Reason for site selection | Approximate distance from Site (m) |
|--------------------------------------|---|------------------------------------|
| Stroudwater Canal - Stonehouse | Structural diversity with significant botanical and animal interest | 95 |
| Stonehouse Newt Pond | Amphibian interest | 125 |
| River Frome Mainstream & Tributaries | Structural diversity with significant botanical and animal interest | 220 |
| Bond's Mill Bank | Plant interest - Wild Clary | 355 |
| Chipman's Platt - A38 (A419) | Lowland meadow | 815 |

Extended Search for SPA, SAC and Ramsar Sites

2.1.1 There is one SAC site within 5km of the proposed development site and this is Rodborough Common SAC, located approximately 4.9km east of the Site. Rodborough Common SAC is designated due to being the most extensive area of semi-natural dry grasslands in the Cotswolds and this site is also designated as a Site of Special Scientific Interest (SSSI).

3.1.4 There are no Ramsar sites or SPA sites within 5km of the proposed development site.

Bat Records

2.1.1 The biological data search yielded records of 164 records of bats within 2km of the proposed development Site, comprising of 11 different species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, brown long-eared bat *Plecotus auritus*, greater horseshoe *Rhinolophus ferrumequinum*, lesser horseshoe *R. hipposideros*, serotine *Eptesicus serotinus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *M. nattereri*, Whiskered bat *M. mystacinus*, noctule *Nyctalus noctule* and Leisler's bat *N. leisleri*. There were also some *Myotis*, *Plecotus* and *Nyctalus* species records which were not identified to species level. The closest bat records were located at Stonehouse Court Hotel (precise building location not provided) but none of these records were roost records. Species recorded at Stonehouse Court Hotel included lesser horseshoe, *Myotis* sp., noctule, common pipistrelle and soprano pipistrelle. The closest record of a roost (lesser horseshoe) appeared to be approximately 900m distant from the Site.

3.2 Preliminary Roost Assessment

2.1.1 The results of the Preliminary Roost Assessment are outlined in Table 2. Reference should be made to the photographs in Appendix 2.

Table 2. Preliminary Roost Assessment Results

| Internal/ External | Description |
|-----------------------|--|
| External | <p>There were large glass windows along the west and east elevations, which allowed ample natural light into the ground floor of the building. The external walls were of stone construction, and the stone walls appeared to be in good condition. However, there was one gap at the wall top on the north elevation of the building (between the wall and wooden eaves). There were also several similar gaps along the east elevation between the wall tops and wooden eaves which could allow potential access for bats to the internal loft, and a broken wooden panel on east elevation roof. Additionally, on the east elevation there were visible gaps under lead flashing and roof tiles which could provide potential roost features for crevice-dwelling species of bats. On the south elevation there was a small lean-to used for storage and there were no obvious potential roost features on this elevation of the building. On the north elevation there was a small flat roof above the building entrance. On the flat roof there were some areas where roof felt appeared to be torn, but this did not appear to create a large enough gap to be used as a potential roost feature for bats.</p> |
| Internal | <p>Internally there was a large loft space which covered the entire building. This was accessed via a loft hatch in a ground floor storage room. There were a few potential access points for bats including a potential gap on the east elevation roof, where daylight was visible. Also, there were visible gaps in the wooden eaves along the west elevation of the roof, but these appeared to be too small to allow bats access to the loft interior. The loft was insulated, and the roof was supported by metal and wooden roof beams. As the loft could not be fully inspected, it was not possible to fully determine whether there were potential roost features in the loft e.g. gaps under roof lining. However, it was considered possible that bats could access the loft space, in particular via gaps on the east elevation roof.</p> <p>The ground floor of the building was fully inspected and there were no potential roost features or suitable places for bats to roost in this area of the building.</p> <p>Due to the potential access points to the internal loft, and the presence of a few potential external roost features, the building was assessed as having low potential to support roosting bats.</p> <p>There were no obvious nesting opportunities for birds within the building.</p> |

4 Discussion and Recommendations

4.1 Discussion

Desk Study

4.1.1 The five non-statutory nature conservation sites identified within 1km of the Site, are sufficiently distant from the proposed development Site such that the proposed works to the Caroline Suite would not directly impact these nature conservation sites. Furthermore, the scope of the proposed works is relatively small, being limited to roof repairs and installation of solar panels on the existing building only.

3.1.4 The data search for bats within 2km of the Site returned several records of bats at Stonehouse Court Hotel (exact location not known) and these records included lesser horseshoe, *Myotis* sp., noctule, common pipistrelle and soprano pipistrelle. None of these records were of roosting bats. However, the records indicate that these species are present locally. Crevice-dwelling species such as common pipistrelle, soprano pipistrelle and *Myotis* species could utilise potential roost features on the surveyed building i.e. the Caroline Suite.

Roosting Bats

3.1.4 Bats and their resting places are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. The results of the PRA confirm the need for further bat surveys, and in accordance with best practice guidelines, one dusk emergence/dawn re-entry survey is required for the Caroline Suite building to establish presence/absence of roosting bats. If a bat roost is confirmed on these surveys, a total minimum of two further emergence/re-entry surveys will be needed to characterise the roost. It should be noted that no works which could obstruct access to the potential roosting sites and/or damage/destroy these potential roosting sites should be undertaken prior to the bat surveys being carried out.

4.1.4 The results of the dedicated bat surveys will inform appropriate mitigation, compensation, and licence requirements for roosting bats.

Commuting/Foraging Bats

- 4.1.1 As proposed works will only impact the building, and no commuting/foraging habitat will be impacted by proposed works, no bat activity surveys are required.
- 3.1.4 In case any additional site lighting is required, the following guidance has been included. Light sources, lamps, LEDs and their fittings come in a variety of different specifications which a lighting professional can help to select. However, the following should be considered when choosing luminaires and their potential impact on Key Habitats and features (Institution of Lighting Professionals, 2023):

All luminaires should lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used.

LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.

A warm white light source (2700Kelvin or lower) should be adopted to reduce blue light component.

Light sources should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.

Internal luminaires can be recessed (as opposed to using a pendant fitting) where installed in proximity to windows to reduce glare and light spill.

Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges.

Column heights should be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards.

Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered.

Luminaires should always be mounted horizontally, with no light output above 90° and/or no upward tilt.

Where appropriate, external security lighting should be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate.

Use of a Central Management System (CMS) with additional web-enabled devices to light on demand. NB: Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS.

The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues.

Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely.

4.2 Nesting Birds

3.1.4 All birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). It is therefore generally unlawful to intentionally kill or injure a bird, damage or destroy an occupied nest or take or destroy eggs other than in exceptional prescribed circumstances. No nesting birds were encountered in any part of the Caroline Suite during the PRA survey and it is considered unlikely that the potential roost features noted during the PRA survey could be used by nesting birds, though the possibility cannot be ruled out. Therefore, development operations should take care to avoid the risk of harm to birds and their nests, especially during the nesting season (generally considered to be March to August inclusive). If works are to be undertaken during the nesting season, a thorough check for nesting birds should be undertaken before works

start, seeking the advice of a suitably qualified ecologist to provide advice on the most appropriate way to proceed if bird activity is observed.

Enhancements

- 3.1.4 In line with the requirements of planning policy for developments to provide biodiversity net gain where possible, it is recommended that any proposed works include enhancements for wildlife such as installation of bat and bird boxes.
- 3.1.4 Roosting opportunities for local bats can be incorporated into renovated buildings through the installation of bat boxes under the eaves either on the exterior walls (e.g. Schwegler 1WQ/1FF bat box) or fitted into the walls (e.g. Habibat 001 bat box) and the creation of raised ridge tiles. Bat boxes (e.g. Schwegler 2FN) can also be installed on medium - large trees. Bat boxes should be installed at minimum heights of 3.5m, facing away from external illumination and should ideally face in a south-east or south-west orientation. Examples are provided in the Ecological Enhancements Appendix below.
- 4.2.4 Nesting opportunities for house sparrows *Passer domesticus* and swifts *Apus apus* can be provided in the form of swift bricks (that are fitted into the walls and are readily used by these and other species of small bird) or where it is not possible to fit into the wall, swift boxes can be fitted externally. House martins *Delichon urbicum* can be provided with nesting provision in the form of house martin cups, which can be fitted on the exterior walls of a building. Barns, carports and open fronted porches or large overhanging eaves are suitable locations for swallow cups to provide nesting features for swallows *Hirundo rustica*. All these species have undergone a decline in recent years. These nesting features should be installed under the eaves of a building at minimum heights of 2.5m and face in a north to south-east direction. In addition, hole-fronted and open-fronted bird boxes can be installed on medium-large trees at similar heights and directions to attract other species of birds. Examples are provided in the Ecological Enhancements Appendix below.
- 4.3 Timeframe that survey remains valid
- 3.1.4 Please note that unless otherwise stated, the contents of this report will remain valid for a maximum period of 12 months from date of issue (CIEEM, 2019). Beyond this, updated survey work may be required to establish any changes in baseline conditions.

5 References

Bat Conservation Trust. 2012. Bats and Buildings. Bats and the Built Environment Series. London.

Bat Conservation Trust. 2018. http://www.bats.org.uk/pages/bat_boxes.html (Accessed June 2023).

Bat Conservation Trust. 2018. Bats and Artificial Lighting in the UK. Bats and the Built Environment Series. London.

CIEEM. 2019. Advice Note On The Lifespan Of Ecological Reports And Surveys. CIEEM, Winchester.

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

Institution of Lighting Professionals. 2023. (Bat Conservation Trust) Guidance Note GN08/23 Bats and Artificial Lighting At Night.

Multi-Agency Geographical Information for the Countryside. <http://magic.defra.gov.uk> (Accessed August 2023).

Mitchell-Jones, A.J. 2004 Bat mitigation guidelines. English Nature, Peterborough.

Mitchell-Jones, A.J. and McLeish, A.P. 1999 (revised 2004). The Bat Workers Manual. Joint Nature Conservation Committee, Peterborough.

UK Biodiversity Framework <http://jncc.defra.gov.uk/page-6189>

Appendix 1 – Policy & Legal Considerations

Statutory nature conservation sites and protected species are a ‘material consideration’ in the UK planning process (DCLG, March 2012). Where planning permission is not required, for example on proposals for external repair to structures, consideration of protected species remains necessary given their protection under UK law.

The Conservation of Habitats and Species Regulations 2017 transpose the requirements of European Directives such as the Habitats Directive and Birds Directive¹ into UK law, enabling the designation of protected sites and species at a European level.

The Wildlife and Countryside Act 1981 (as amended) forms the key piece of UK legislation relating to the protection of habitats and species. The Countryside and Rights of Way Act 2000 provides additional support to the 1981 Act, for example, increasing the protection of certain reptile species. Specific protection for badger is provided by the Protection of Badger Act 1992. The Wild Mammals (Protection) Act 1996 sets out the welfare framework with respect to wild mammals prohibiting a range of activities which may cause unnecessary suffering.

The Government has a duty to ensure that parties take reasonable practicable steps to further the conservation of habitats and species of Principal Importance for Conservation in England listed under Section 41 of the Natural Environment and Rural Communities Bill 2006². In addition, the 2006 Act places a Biodiversity Duty on public authorities who ‘must, in exercising [their] functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’ (Section 40 (1)). Criteria for selection of priority habitats and species include, for example, international threat (such that species may be protected in their strong holds) and marked national decline.

The National Planning Policy Framework 2021³ states that the planning system should minimise impacts on biodiversity, providing net gains in biodiversity, wherever possible. Section 15 states that 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 a Site 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 features 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 reasons⁴ 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 developments 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.



¹Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and Council Directive 79/409/EEC on the Conservation of Wild Birds, respectively.



²The NERC Act refers to “species of principle importance for the conservation of biodiversity”, which translates to BAP habitats and species occurring in England.



³https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf



⁴ For example, infrastructure projects (including nationally significant infrastructure projects, orders under the Transport and Works Act and hybrid bills), where the public benefit would clearly outweigh the loss or deterioration of habitat.



Appendix 2 – Photographs

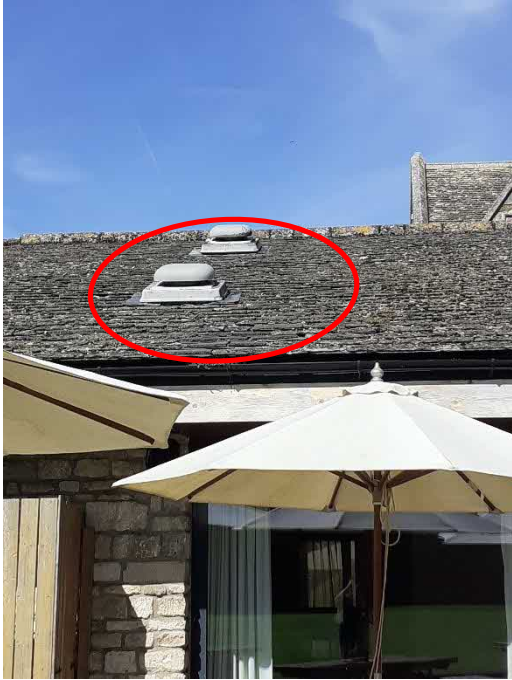
| No | Photo | Description |
|----|---|---|
| 1 |  | North and west elevation of the Caroline Suite, viewed from the driveway of Stonehouse Court Hotel. |
| 2 |  | South and east elevations of the Caroline Suite, with surrounding garden visible to the fore. |

| No | Photo | Description |
|----|---|---|
| 3 |  A wide-angle photograph showing the east elevation of the Caroline Suite, a large stone building with a gabled roof and two chimneys. The building is situated behind a vast, well-maintained green lawn. The sky is clear blue with a few wispy clouds. Trees are visible in the background. | East elevation of the Caroline Suite and amenity grassland. |
| 4 |  An interior photograph of the loft space. The room is dimly lit, with a bright light source on the right. The ceiling consists of wooden rafters. Large, flexible ducts wrapped in silver insulation are visible, running across the floor. A red circle highlights a small opening or hole in the insulation or ductwork. The floor is covered with wooden joists and some debris. | Internal loft of Caroline Suite, with daylight visible on the east elevation of the roof, near the location of vents. |

| No | Photo | Description |
|----|--|---|
| 5 |  A photograph of an internal loft space. The floor is made of rough, uneven concrete. Several white cables are bundled together and run across the floor. A red circle highlights a small opening or gap in the wooden eaves structure above the floor. | Internal loft of Caroline Suite, with daylight visible on the west elevation wooden eaves. |
| 6 |  A close-up photograph of a stone wall. The wall is made of large, irregular grey stones. Above the wall, there are dark brown wooden eaves. A red circle highlights a small gap between the top of the stone wall and the bottom of the wooden eaves. | Gap between north elevation wall and wooden eaves (potentially leading to internal loft space). |

| No | Photo | Description |
|----|--|--|
| 7 |  | One of several gaps between east elevation wall and wooden eaves (potentially leading to internal loft space). |
| 8 |  | Broken wooden panel on east elevation roof. |

| No | Photo | Description |
|----|--|---|
| 9 |  A close-up photograph of the corner of a stone wall. The wall is constructed from large, light-colored stone blocks. Above the wall, there are wooden eaves. A red circle highlights a gap between the top of the stone wall and the wooden eaves. | <p>Gaps between east elevation wall and wooden eaves (potentially leading to internal loft space) located near north-east corner of roof.</p> |
| 10 |  A photograph of a flat roof area. The roof is covered in grey felt. A red circle highlights a section of the roof where the felt appears to be torn or missing. The roof is supported by a wooden overhang and a metal pole. In the background, there are trees and a building. | <p>Torn roof felt above flat roof on north elevation of building. Unlikely to be a potential roost feature for bats.</p> |

| No | Photo | Description |
|----|---|--|
| 11 |  | <p>Gaps under roof tiles and lead flashing were visible near the roof vents on the east elevation roof (daylight was visible in the internal loft space in this approximate location).</p> |

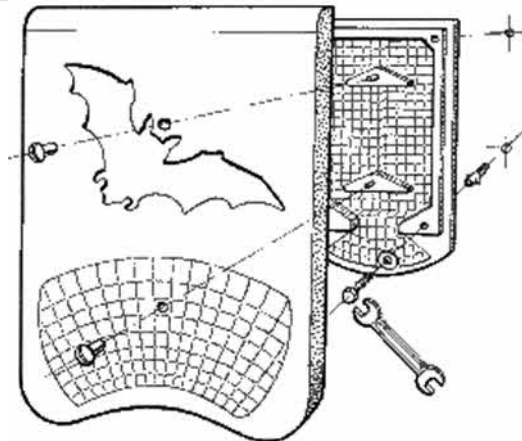
Appendix 3 – Ecological Enhancements

BAT ROOSTING FEATURES

Schwegler 1FF bat box



Schwegler 1WQ Summer & Winter bat



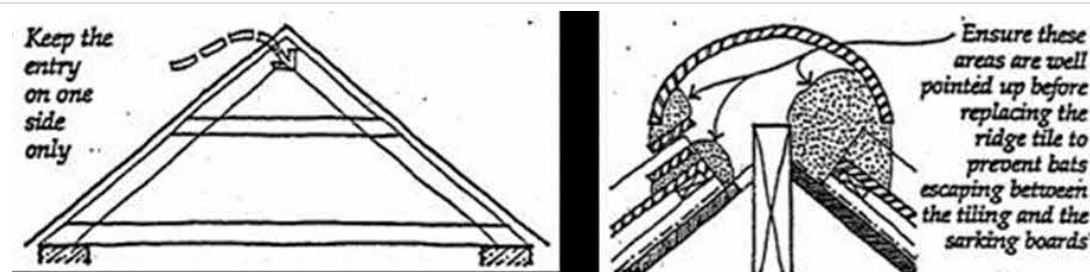
Habibat 001 Bat Box – integral bat box, fitted into wall



Schwegler 2FN bat box for installation in trees



Diagrammatic view of ridge tile and cross section through ridge tile showing access point (taken from Scottish Natural Heritage 1996). Bitumastic lining must be used near/on the ridge beam to ensure bats can only have contact with this type of membrane to avoid any possible entanglement with a breathable membrane.



IRD BOXES

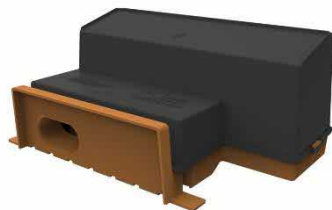
Various designs of swift boxes



Swift Brick



Swallow Cup



Hole-fronted bird box (for trees)



Open-fronted bird box (for trees)



House Martin Terrace Box



Many wildlife species benefit greatly from considerate planting choices that still meet our practical and aesthetic needs. Plants and trees provide food for wildlife as well as places to nest and rest. Vegetation providing a variety of these functions creates an environment more beneficial for wildlife.

Non native species

Native species provide the best habitat for UK wildlife but there are also many non-native species, which are single flowering and/or provide fruits/nuts/seeds that can be used as food sources for insects, birds and small mammals. When using these non-native species in planting schemes, care should be taken to avoid invasive species such as Cotoneaster and Rhododendron. This is especially important when sites are adjacent to open countryside particularly nature reserves.



Uses of Wildlife Planting

Wildlife value can be easily incorporated into visually pleasing and useful green areas and amenity spaces, such as borders, grass verges and tree screens.

Attractive Borders: Well selected decorative borders can be valuable for many insects and birds. Native plants can be mixed with single flowering ornamental species to add aesthetic interest and increase the flowering period of a planting scheme.

Shrubs and hedges: Native spiky species like blackthorn and hawthorn are effective barriers when used in hedges. They also provide an attractive feature at all times of year especially when in blossom and fruit. Bushy areas of foliage provide useful nesting and feeding areas for birds and small mammals, as well as foraging/commuting corridors for bats.

Grasses mixes and verges: Leaving uncut areas of suitable grasses provides great wildlife value and is economical to manage. Diverse grassy areas and verges also create an attractive human environment with different flowers and colours. There are a range of native grass and flower mixes for various soil types available on the market.





Selecting Suitable Species

There are wildlife friendly species suitable for all situations, from fields, verges, shady corners or small gardens. Listed below are native wildlife friendly plant species organised by type and suitability for different locations.

Large Trees

Ash *Fraxinus excelsior*
Beech *Fagus sylvatica*
English Elm *Ulmus procera*
Oak *Quercus robur* or *Q. petraea*
Small-leaved lime *Tilia cordata*
White willow *Salix alba*
Wild cherry *Prunus avium*



White willow

Medium/small trees

Alder *Alnus glutinosa*
Aspen *Populus tremula*
Crab apple *Malus sylvestris*
Field maple *Acer campestre*
Holly *Ilex aquifolium*
Rowan *Sorbus aucuparia*
Silver birch *Betula pendula*
Yew *Taxus baccata*



Tussocky grassland

Native shrubs

Blackthorn *Prunus spinosa*
Dogwood *Cornus sanguinea*
Elder *Sambucus nigra*
Guelder rose *Viburnum opulus*
Hawthorn *Crataegus monogyna*
Hazel *Corylus avellana*



Blackthorn

Plants for shady areas

Archangel *Lamiaeum galeobdolon*
Betony *Stachys officinalis*
Bluebell *Hyacinthoides non-scriptus*
Bugle *Ajuga reptans*
Foxglove *Digitalis purpurea*
Ground ivy *Glechoma hederacea*
Lily of the valley *Convallaria majalis*
Lords-and ladies/cuckoopint *Arum maculatum*
Nettle-leaved bellflower *Campanula trachelium*
Primrose *Primula vulgaris*
Sweet violet *Viola odorata*
Wild daffodil *Narcissus pseudo-narcissus*

Plants for marshy areas & pond edges

Bugle *Ajuga reptans*
Hemp agrimony *Eupatorium cannabinum*
Marsh marigold *Caltha palustris*
Marsh woundwort *Stachys palustris*
Meadowsweet *Filipendula ulmaria*
Purple loosestrife *Lythrum salicaria*
Ragged robin *Lychnis flos-cuculi*
Water avens *Geum rivale*
Water forget-me-not *Myosotis scorpioides*
Water mint *Mentha aquatica*
Water violet *Hottonia palustris*
Yellow flag *Iris pseudacorus*

**Beneficial cultivated plants
(generally non-natives)**

Grecian windflower *Anemone blanda*
Angelica *Angelica archangelica*
Aubretia *Aubretia deltoidea*
California poppy *Eschscholtzia californica*
Candytuft *Iberis sempervirens*
Christmas rose *Helleborus niger*
Cosmos *Cosmos bipinnatus*
Evening primrose *Oenothera biennis*
Fleabane *Erigeron spp.*
Forget-me-not *Myosotis spp.*
French marigold *Tagetes patula*
Globe thistle *Echinops ritro*
Grape hyacinth *Muscari botryodes*
Hollyhock *Althaea rosea*
Honesty *Lunaria rediviva*
Ice plant *Sedum spectabile*
Lenten rose *Helleborus orientalis*
Tree mallow *Lavatera spp.*
Michaelmas daisy *Aster novae-belgii*
Mint *Mentha x rotundifolia*
Perennial cornflower *Centaurea montana*
Perennial sunflower *Helianthus decapetalus*
Phlox *Phlox paniculata*
Poached-egg plant *Limnanthes douglasii*
Red valerian *Centranthus ruber*
Snapdragon *Antirrhinum majus*
Spring crocus *Crocus chrysanthus* and hybrids
Sweet alyssum *Lobularia maritima*
Sweet bergamot *Monarda didyma*
Sweet William *Dianthus barbatus*
Tobacco plant *Nicotiana affinis*
Wallflower *Cheiranthus cheiri*
Alpine rock-cress *Arabis alpina*
Winter aconite *Eranthis hyemalis*
Yellow alyssum *Alyssum saxatile*

Native wildflowers for borders

Agrimony *Agrimonia eupatoria*
Betony *Stachys officinalis*
Bluebell *Hyacinthoides non-scriptus*
Chicory *Cichorium intybus*
Chives *Allium schoenoprasum*
Common poppy *Papaver rhoeas*
Corncockle *Agrostemma githago*
Cornflower *Centaurea cyanus*
Corn marigold *Chrysanthemum segetum*
Cowslip *Primula veris*
Cuckooflower *Cardamine pratensis*
Dame's-violet *Hesperis matronalis*
Devil's-bit scabious *Succisa pratensis*
Field scabious *Knautia arvensis*
Foxglove *Digitalis purpurea*
Goldenrod *Solidago virgaurea*
Great mullein *Verbascum thapsus*
Greater knapweed *Centaurea scabiosa*
Harebell *Campanula rotundifolia*
Herb-robert *Geranium robertianum*
Lady's bedstraw *Galium verum*
Marjoram *Origanum vulgare*
Meadow cranesbill *Geranium pratense*
Common mallow *Malva sylvestris*
Oxeye daisy *Leucanthemum vulgare*
Primrose *Primula vulgaris*
Red campion *Silene dioica*
Snowdrop *Galanthus nivalis*
Spiked speedwell *Veronica spicata*
Tansy *Tanacetum vulgare*
Teasel *Dipsacus fullonum*
Toadflax *Linaria vulgaris*
White campion *Silene alba*
Wild thyme *Thymus drucei*
Yellow loosestrife *Lysimachia vulgaris*



Marjoram



Cornflower



Perennial sunflower

Appendix 4 – Ecological Experience

██████████ Ecologist, BSc (Hons) MSc

██████ has worked with Wild Service for several years and has recently gained her MSc in Applied Ecology from the University of Gloucestershire. ██████ dissertation project involved large-scale data analysis of biometric bird ringing data to assess biometric changes in UK wintering waterbirds. ██████ has a keen interest in bat ecology and in addition to undertaking professional bat surveys and assessments, she has also studied bats in Ghana, West Africa. She is experienced in a range of ecological surveys including Phase 1 habitat assessments, protected species surveys, reptile surveys and translocations, great crested newt and dormouse surveys. ██████ additional skills include advanced data analysis and GIS mapping using various software packages including QGIS and ArcGIS. In addition to project delivery, she also assists with the management of Wild Service projects. ██████ has also spent time volunteering on conservation projects with the Gloucestershire Bat Group and the Gloucestershire Wildlife Trust. Julia is a Qualifying member of CIEEM and holds a CSCS card. She is currently working towards her Natural England bat and great crested newt licences.

██████████ Head of Ecology & Principal Ecologist, BSc (Hons) PhD, CEnv MCIEEM

██████████ has worked in both the academic and consultancy ecology sectors since 2000 with a focus on mammalian ecology, particularly ██████ dormice, bats, water voles and otters. ██████ manages the Consultancy as well as being involved in project delivery. She has managed ecological projects, ranging in size and type, both in the UK and abroad. She regularly advises clients on the planning process in relation to Ecology. ██████ has expertise in a wide variety of ecological survey techniques including Preliminary Ecological Appraisals/Phase 1 habitat assessments and a variety of protected species surveys (e.g. the aforementioned mammal species as well as reptiles and great crested newts).

██████████ also devises ecological mitigation schemes, both as part of protected species mitigation licences (e.g. bats, great crested newts, ██████ dormice, water voles, otters) and

for projects not requiring licensing (e.g. reptiles). She has produced a wide variety of preliminary ecological appraisals, BREEAM/CSH Ecology Assessments, mitigation licences for protected species (including Bat Mitigation Class Licences), Ecological Impact Assessments (EclA), Construction Ecological Management plans, Habitat Regulations Assessments, Biodiversity Net Gain assessments, Biodiversity Enhancement Schemes, Ecological Design Strategies as well as writing for scientific journals, books and magazines. As a Building with Nature Assessor, [REDACTED] also has expertise in providing green infrastructure advice to projects.

[REDACTED] offers a scientific approach to projects with additional skills in radiotracking, bat call analysis, statistical analysis, home range and compositional habitat analysis and Geographical Information Systems (GIS) mapping. [REDACTED] holds Natural England and Natural Resources Wales licences for bats and dormice as well as Natural England licences for great crested newts and water voles. She is also a Registered Consultant of the Bat Low Impact Class (BLIC) Licence and holds a CSCS card.



ECOLOGICAL SERVICES

MITIGATION

CONSERVATION

- We provide ecological surveys and assessments, mitigation, advice and guidance regarding wildlife, plants and habitats for both development and conservation projects throughout the UK.
- Wild Service is the Ecological Consultancy for Gloucestershire Wildlife Trust. As such, the company reinvests its profits into local conservation work.
- We are also part of a wider network of Wildlife Trust Consultancies enabling us to offer national delivery with local expertise.

- We offer the following types of service to clients:

Ecological Surveys
Protected Species Licences
Ecological Management Plans
Biodiversity Net Gain
Ecological Impact Assessments (EclA)
BREEAM Assessments
Mitigation, Enhancement & Rewilding
Green Infrastructure Planning (Building with Nature)
Arboricultural Surveys
Landscape Consultancy Services

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