

Ebley House Conservatory, Stroud

Bat Dusk Emergence Survey Report

On behalf of The Novalis Trust

Project Code: JM2023019Bv1

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1 Introduction

1.1 Scope

1.1.1 Wild Service was commissioned by The Novalis Trust to carry out two dusk emergence surveys on Ebley House, 235 Westward Road, Stroud, Gloucestershire, GL5 4SX (hereafter referred to as the 'Site'). The assessment was requested to inform proposals to refurbish and repair the conservatory building adjoining the main house.

1.1.2 This report presents the findings of dusk emergence surveys for bats undertaken by Wild Service and identifies ecological constraints and opportunities. It also proposes a series of pragmatic and proportional mitigation and enhancement measures.

1.2 Background Information

1.1.2 A Preliminary Roost Assessment (PRA) was undertaken by Wild Service in June 2023, including a daytime inspection of the conservatory building, and the assessment was supported by a desk study from the Local Record Centre (Wild Service, 2023). Due to the presence of possible feeding remains in one internal room of the conservatory, and potential roost features present in the building, the building was assessed as having moderate potential to support roosting bats. As such, and in accordance with best practice guidelines (Collins, 2016), two dusk emergence surveys were recommended to establish presence/absence of roosting bats.

1.1.2 Desk study results from Local Record Centre confirmed there were no statutory nature conservation sites within 1km of the Site. There were four Local Wildlife Sites within 1km of the site, all of which were considered to be sufficiently distant from the proposed development Site such that the proposed repairs/renovations to the conservatory building would not directly impact these nature conservation sites. The desk study results returned no bat roost records on/near the proposed development Site. However, several different species of bats were recorded within the 2km search radius, the closest being approximately 250m from the Site. Full desk study results are provided in the PRA report (Wild Service, 2023).

1.3 Site Description

1.1.2 Ebley House is a Grade II listed building located on Westward Road, to the west of Stroud, Gloucestershire. Adjoining Ebley House to the southwest is a conservatory building which is comprised of two adjoining rooms, one featuring a porch entrance from the property driveway. To the rear of the conservatory there is a room backing onto an adjacent car park which has a half height retaining wall. There is a small corridor which connects the conservatory to the main house. A site plan is provided in Figure 1 indicating the site ownership boundary (1a) and the area of proposed works i.e. the conservatory (1b).

1.1.2 The surrounding landscape is predominantly urban, with Westward Road passing the Site to the north, and residential and commercial properties to the east and west of the Site. Immediately to the south of Ebley House is the property garden, with amenity grassland and ornamental planting. A canal passes approximately 100m to the south of the Site.

1.1.2 The central Ordnance Survey Grid Reference for the Site is SO 82721 04739.

1.1 Legislation

1.1.1 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.

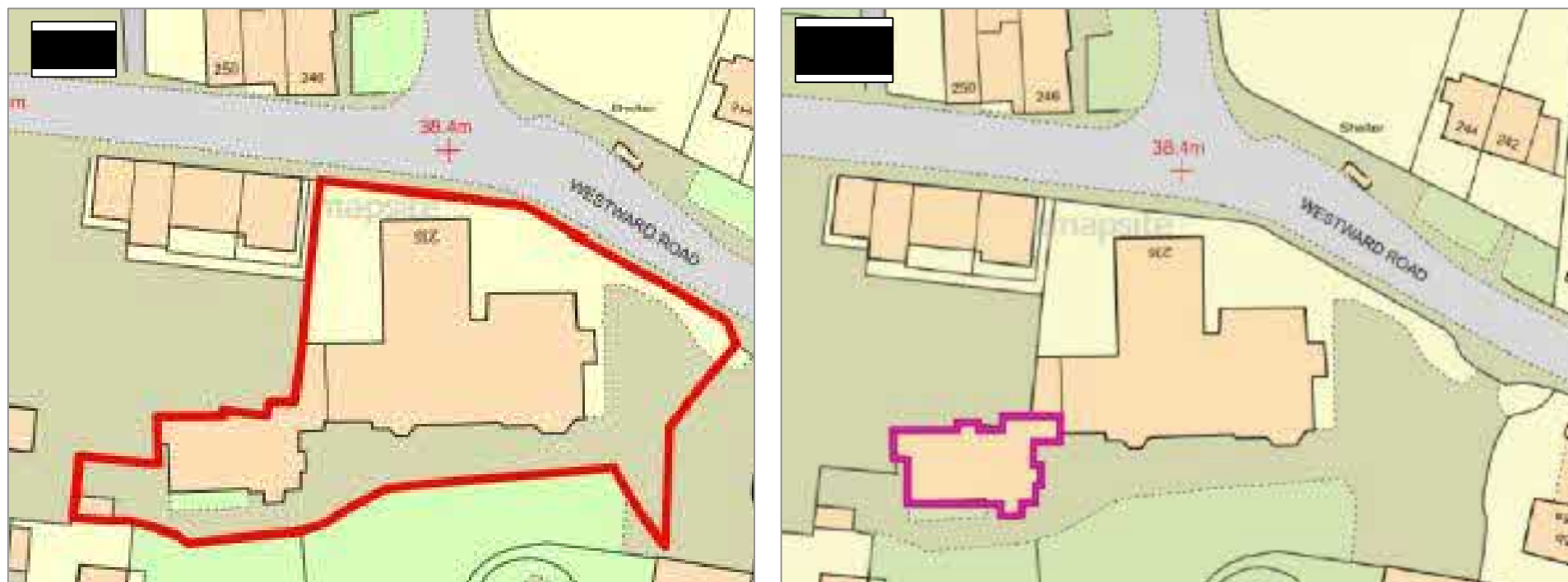


Figure 1. (a) Site plan with ownership boundary outlined in red; and
(b) Area of works (the conservatory) outlined in magenta.
Plans provided by client, annotated by Wild Service

2 Methods

2.1 Dusk Emergence Surveys

2.1.1 Surveyors were positioned around the conservatory building so that potential roosting features could be viewed (see Figure 2). Each surveyor had a radio to facilitate communication between surveyors regarding bat roosting and foraging behaviour. The dusk surveys began approximately 15 minutes prior to sunset and ended between approximately 90 minutes after sunset, with the exception of the second dusk emergence survey which was cancelled 45 minutes after sunset due to heavy rain (see Limitations section below).

2.1.1 The survey team comprised of [REDACTED], an accredited agent under Natural England Class Level 2 bat licence ([REDACTED] NE Bat Survey Level 2: 2015-13418-CLS-CLS, WML CL18), [REDACTED], [REDACTED] and [REDACTED]

2.1.1 Bat detectors were used to record bat echolocation calls to identify the species present. Echometer Touch 2 Pro detectors, all set to time expansion mode, were used to carry out the surveys. Night vision aids (including Sony Handycam FDR-AX53 with infrared illuminator) were used to assist viewing bat emergences/re-entries at low light levels.

2.1.4 Each surveyor is trained and has prior experience in carrying out dusk emergence/dawn re-entry surveys and the use of bat detectors.

2.1 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 During the second scheduled dusk emergence survey and despite weather forecasts for dry, warm weather, heavy rain began approximately 45 minutes after sunset resulting in the survey being cancelled. As such, an additional survey was scheduled at the earliest possible date to ensure a full 90-minute survey was undertaken in accordance with best practice guidelines. Although the additional survey was undertaken in

September, and therefore in the sub-optimal period for undertaking emergence surveys, the weather conditions for the third survey were optimal for undertaking emergence surveys. Furthermore, the survey data collected on the second emergence survey (undertaken in August) has been included within this report, as the collected data is considered valid and provides an indication of bat usage of the Site.



Figure 2. Bat Surveyor Positions (S1-S3)
Plan provided by client, annotated by Wild Service

3 Results

2.1 Dusk Emergence Surveys

2.1.1 Survey weather data is recorded in Table 1.

Table 1. Survey Conditions

Survey date	Sunset time	Start/end of survey	Temperature (°c)	Wind (beaufort scale)	Rain
14/08/2023	20:34	Start 20:19	17.6	0	None
		End 20:27	16.3	0	None
31/08/2023	19:59	Start 19:34	15.0	0	None
		End 20:45	15.0	2	Heavy rain began at 20:45 – survey cancelled.
21/09/2023	19:10	Start 18:55	14.2	0	None
		End 20:40	11.5	0	None

2.1.1 The results of the dusk emergence surveys are provided below. Reference should be made to the photographs provided in Appendix 2.

First Emergence Survey – 14/08/2023

2.1.1 No bats were recorded emerging from, or entering, the building. A total of five bat passes were recorded, all in the south garden to the front of the building, comprising two common pipistrelle *Pipistrellus pipistrellus* passes (21:11 and 21:32) and three soprano pipistrelle *P. pygmaeus* passes (21:14, 21:15 and 21:24). External lights on the adjoining main building to the east of the conservatory illuminated most of the conservatory (in particular the north, south and east elevations) during the full survey period.

Second Emergence Survey – 31/08/2023

- 2.1.4 No bats were recorded emerging from, or entering, the building. A total of five bat passes were recorded, all in the south garden to the rear of the building, comprising three common pipistrelle passes (21:23, 20:33 and 20:39) and two soprano pipistrelle passes (both heard at 20:33). Due to heavy rain the survey was cancelled approximately 45 minutes after sunset. As recorded during the first survey, external lights illuminated most of the north, south and east elevations of the conservatory throughout the survey period.

Third Emergence Survey – 21/09/2023

- 2.1.1 No bats were recorded emerging from, or entering, the building. A total of four bat passes were recorded. Three noctule *Nyctalus noctula* passes were recorded by all surveyors at 19:41, 19:52 and 19:55. One common pipistrelle pass was recorded in the garden to the south of the conservatory at 20:11. External lights illuminated most of the north, south and east elevations of the conservatory throughout the survey period.

2.1 Nesting Birds

- 2.1.1 No nesting birds were observed using the building during the emergence surveys.

4 Discussion and Recommendations

4.1 Discussion

4.1.1 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 dedicated dusk emergence surveys found no evidence of roosting bats in the building i.e. no bats were recorded emerging from, or entering the building.

2.1.4 No nesting birds were recorded on Site, but the building offers nesting opportunities for birds.

4.2 Recommendations

Mitigation – Roosting Bats

2.1.4 As no bats were recorded emerging from (or entering) the building, bats are considered to be absent from the conservatory building at the present time and therefore no further bat surveys are required and there is no requirement for a Natural England mitigation licence in relation to proposed works for building/roof repairs. However, if a bat is found during any part of development, works are to stop immediately, and a suitably qualified ecologist is to be consulted.

2.1.4 As a building with bat roosting potential can be used by bats at any time of year, it is advised that any repair/renovation works to the building are undertaken with a precautionary approach. Any tiles to be removed should be removed by hand and are to be lifted up instead of sliding sideways, to avoid risking injury to bats that may be present underneath.

2.1 Nesting Birds

Mitigation

2.1.4 Although no birds were recorded nesting in the building on Site during the dusk emergence surveys, or the PRA survey undertaken in June 2023, the rear conservatory rooms and loft space could be accessed by small bird species. 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. Therefore, construction/repair works 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 signs of nesting activity are evident at any time before or during the works, then advice from a suitably qualified ecologist should be sought on the most appropriate way to proceed.

4.1 Enhancements

- 4.1.1 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.

Bats

- 2.1.4 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.
- 2.1.4 The external lighting on the adjacent main building on Site, resulted in high levels of light on the conservatory building. It is considered these light levels would reduce the likelihood of roosting bats in areas which are illuminated by these external lights. It is recommended that any proposed lighting should be designed sensitively to minimise light spill and potential impacts on bats in accordance with best practice. 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.

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.

Birds

4.4.4 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. 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 2-2.5m 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.

4.5 Timeframe that Survey Remains Valid

4.1.1 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 August 2023).

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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 web. <http://magic.defra.gov.uk>

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

████████████████████ 1999 (revised 2004). The Bat Workers Manual. Joint Nature Conservation Committee, Peterborough.

■ Wild Service. 2023. Ebley House Conservatory, Stroud: Bat Preliminary Roost Assessment Report. Project Code JM2023019Av1.

Appendix 1 – Policy and 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 [REDACTED] is provided by the Protection of [REDACTED] 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.


³ https://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		South and east elevation of the conservatory at Ebley House, with porch entrance on the south elevation.
2		West elevation of the conservatory with rotten wooden timber around the window frames and tarpaulin/plastic sheet above roof.

No	Photo	Description
3	 <p data-bbox="296 837 552 1016">Potential access point (visible on internal inspection)</p>	<p data-bbox="967 255 1359 629">View of conservatory roof, as seen from over the top of a retaining brick wall. A potential access point to the rear conservatory interior was visible on internal inspection undertaken in June 2023, and the approximate location is circled opposite in red.</p>
4		<p data-bbox="967 1061 1359 1227">View of conservatory roof from staircase on adjoining main building.</p>

No	Photo	Description
5	 A photograph showing the south elevation of Ebley House, a large, multi-story stone building with a prominent chimney and a conservatory. A dark car is parked in the foreground.	<p>South elevation of Ebley House, adjacent to the conservatory. External lights on the main building illuminated most of the north, south and east elevations of the conservatory during emergence surveys.</p>

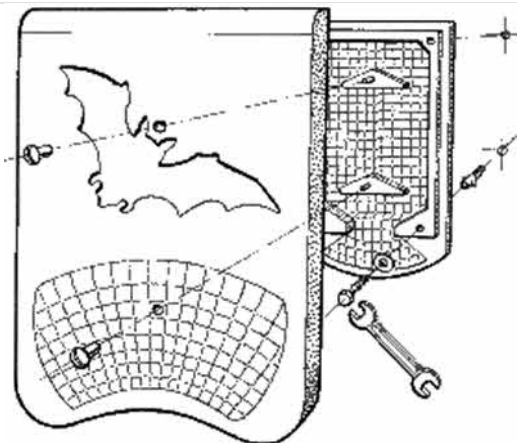
Appendix 3 – Ecological Enhancements

BAT ROOSTING FEATURES

Schwegler 1FF bat box



Schwegler 1WQ Summer & Winter bat



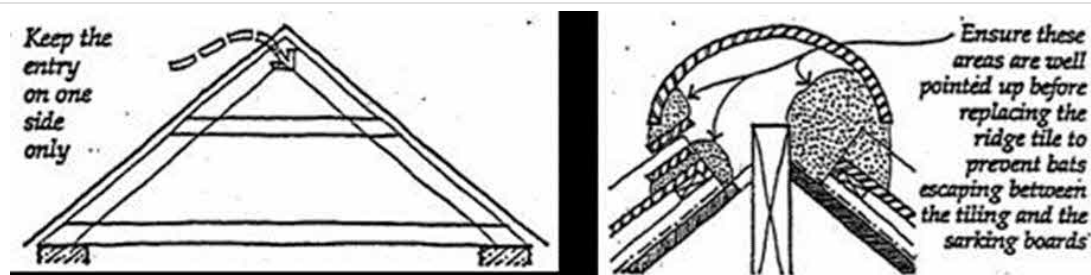
Habibat 001 Bat Box – integral bat box, fitted into wall



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.



BIRD BOXES

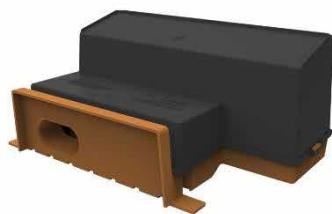
Various designs of swift boxes



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.



Butterfly bush

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.



Wild flower grass mix



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. ██████████'s dissertation project involved large-scale data analysis of biometric bird ringing data to assess biometric changes in UK wintering waterbirds. Julia 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. ██████████'s 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. ██████████ 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.

██████████ Senior Ecologist, BSc (Hons) ACIEEM

██████████ has been working in ecological consultancy since 2016 and has been involved in a wide range of surveys including Extended Phase 1 Habitat surveys and a variety of protected species surveys including bats ██████████, Meles meles, barn owl Tyto alba, great crested newt Triturus cristatus, hazel dormouse Muscardinus avellanarius, reptiles, otter Lutra lutra and water vole Arvicola amphibius. She has experience in writing technical reports, including Preliminary Ecological Appraisals (PEAs), Ecological Impact Assessments (EclAs) and preparation of European Protected Species (EPS) licence applications. She also has experience undertaking Habitat Conditioned Assessments and Biodiversity Net Gain (BNG) calculations as well as being experienced and certified to carry out River Condition Assessments. ██████████'s experience as an Ecological Clerk of Works (ECoW) for a variety of projects. ██████████ Holds Natural England Class Licences for bats (level 1), barn owl and great crested newt. She also holds a valid CSCS card, is

mental health first aider and is an Associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM).

██████████ Associate Ecologist BSc (Hons) MCIEEM

██████████ has 15 years' experience in ecological consultancy with a focus on bat and bird ecology and surveying. She is also an experienced environmental educator. She has worked on a wide range of consultancy projects from residential developments, renewable energy projects and cultural heritage work. ██████████ has undertaken many internal inspections of different man-made structures, trees, and other natural features to assess their potential to support roosting bats. She is also very experienced at planning and undertaking emergence and dawn re-entry surveys for bats alongside activity transects to determine bat use over the wider landscape.

She has also been a bat warden for Natural England since 2006, providing surveys and advice for householders with bats. ██████████ is a Natural England licence holder for bats (Licence number: 2015- 1560-CLS-CLS, WML CL18: Bat Survey Level 2) and is also a volunteer bat roost visitor (2015-10271-CLS-CLS). ██████████ is experienced in providing EPS mitigation on a variety of projects, including cultural heritage projects for the National Trust and the Wye Valley AONB and a wide range of development projects.

██████████ has undertaken voluntary research with Gloucestershire Bat Group (GBG) and ██████████ ██████████ assisting in research of greater horseshoe, Bechstein's and barbastelle bats. With GBG, ██████████ has also led bat walks and talks for the public. ██████████ has over a decade of teaching experience; from primary students, up to University level.

Wild Service



Wildlife Trust
Consultancies

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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