

Ebley House Conservatory, Stroud

Bat Preliminary Roost Assessment Report

On behalf of The Novalis Trust

Project Code: JM2023019Av1

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This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

1 Introduction

1.1 Scope

1.1.1 Wild Service was commissioned by The Novalis Trust to undertake a bat Preliminary Roost Assessment (PRA) of the conservatory at 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 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 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.

1.3 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.

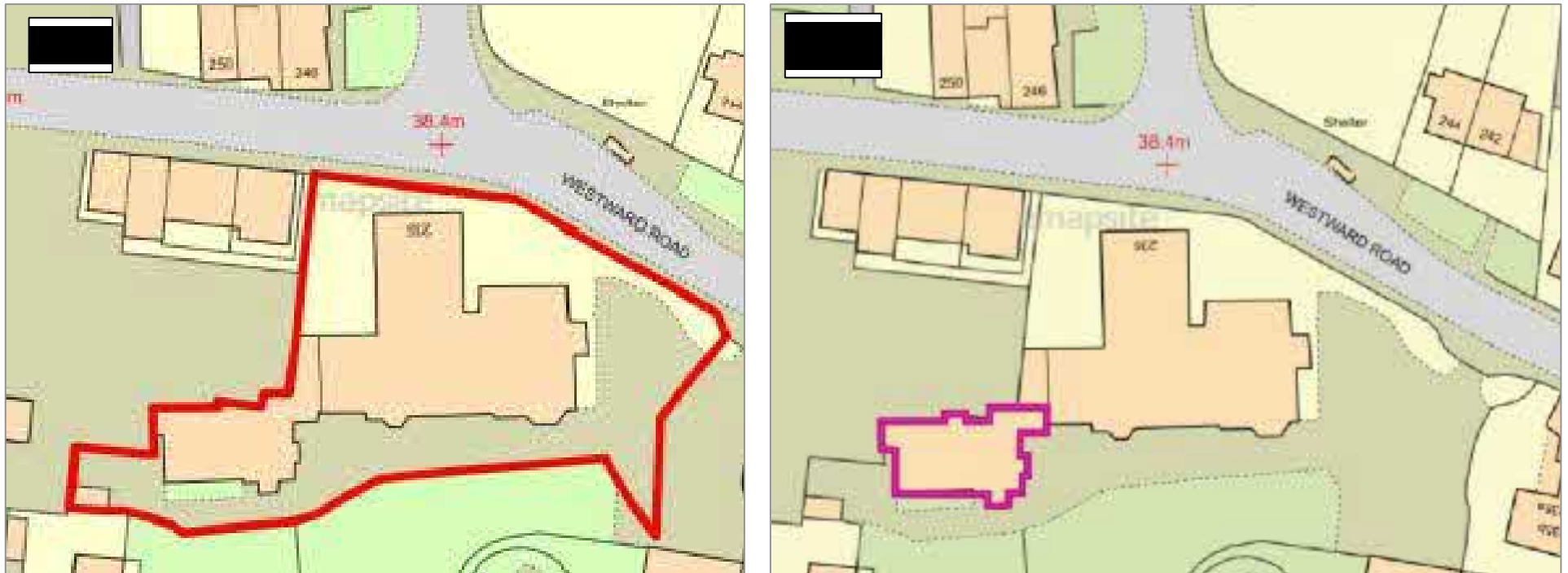


Figure 1. (a) Site plan with ownership boundary outlined in red; and
(b) Area of works (the conservatory) outlined in magenta.
Plans provided by client, annotated by Wild Service

2 Methods

2.1 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 conservatory building at Ebley House was evaluated for bat roosting potential both internally and externally [REDACTED] on 19th June 2023, as an accredited agent under Natural England Class Level 2 bat licence (Elizabeth Pimley 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 buildings' 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> <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>
High to moderate BRP 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> <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>
Low BRP	<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 Internally, some areas of the conservatory were inaccessible. The basement room in the rear conservatory was visible from the bottom of an internal staircase but could not be fully inspected due to the basement floor being partially flooded. The first floor above the rear conservatory was visible from the top of an internal staircase, but the roof void above the first floor was inaccessible for health and safety reasons.
- 2.1.1 Externally, the main roof of the conservatory was partially covered by tarpaulin and therefore the roof beneath the tarpaulin could not be viewed. Detailed site plans were provided by the architect which included descriptions of the inaccessible area of the roof, and these plans were consulted to inform this report.

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 four 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 - Stroud	Structural diversity with significant botanical and animal interest	115
River Frome Mainstream & Tributaries	Structural diversity with significant botanical and animal interest	220
Ebley Tip	Botanical	405
Stroudwater Canal - Stonehouse	Structural diversity with significant botanical and animal interest	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 2km south-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 101 records of bats within 2km of the proposed development Site, comprising of nine 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*, and noctule *Nyctalus noctula*. There were also some *Myotis* species records which were not identified to species level. The closest bat records were located approximately 250m from the Site, but precise grid references were not provided, and therefore the precise location of the nearest records is uncertain.

2.1.1 The nearest roost record was that of a lesser horseshoe day roost approximately 850m to the east of the Site. The only other records of bat roosts related to common pipistrelle day roosts, but precise locations were not provided for these records.

3.2 Preliminary Roost Assessment

2.1.1 The results of the Preliminary Roost Assessment are outlined in Table 2. The internal rooms of the building have been labelled Room 1-4 and these references are used throughout this report (Figure 2). Reference should be made to Figure 2 and photographs in Appendix 2.

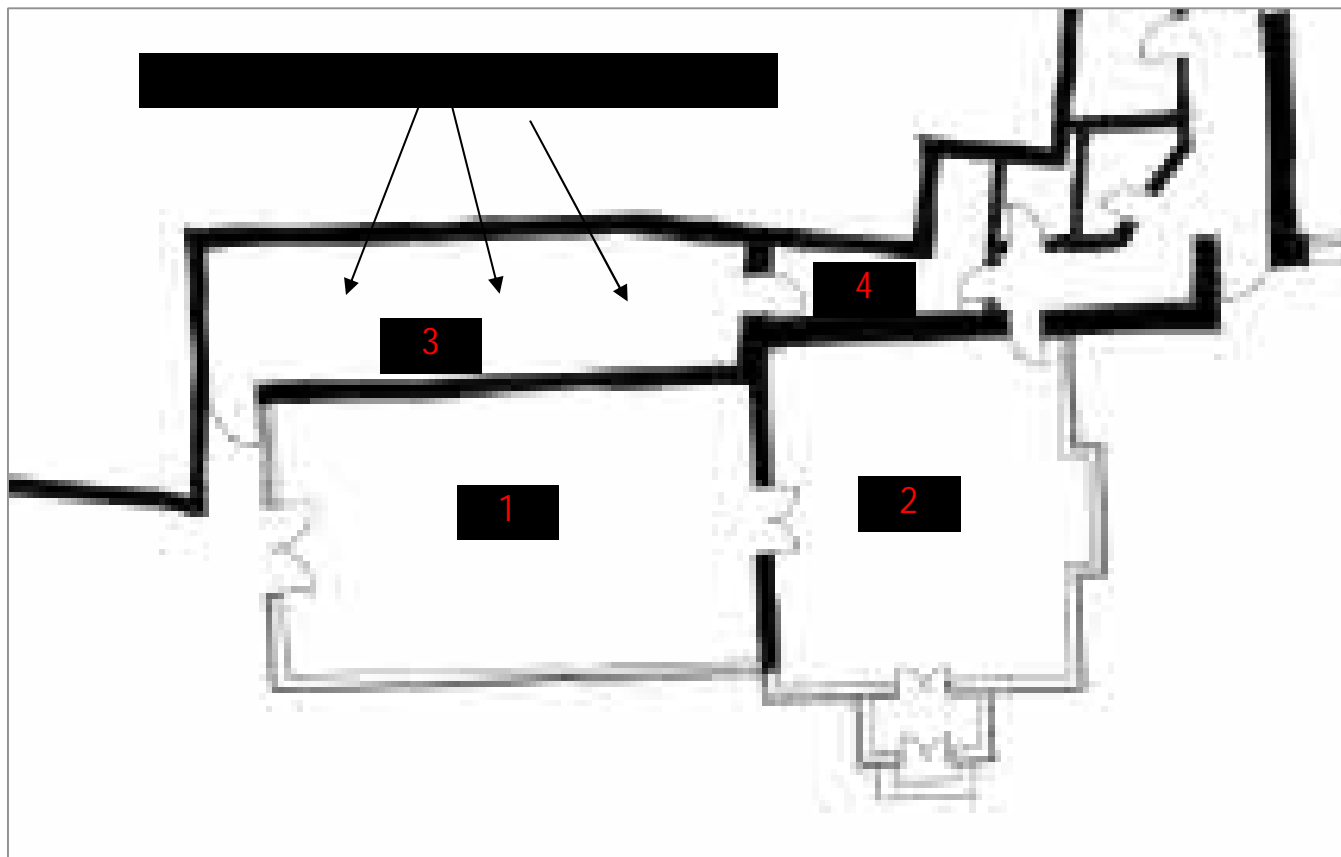


Figure 2: Plan of the conservatory at Ebley House and survey results.
NB: 1-4 indicates internal room numbers.
Plan provided by the client, annotated by Wild Service

Table 2. Preliminary Roost Assessment Results

Internal/ External	Description
External	<p>There were large glass windows along the south, west and east elevations, which allowed ample natural light into the building. The lower half of the external walls on these elevations were of stone construction, and the stone walls appeared to be in good condition. There was evidence of rotten wood around some of the window frames on the south, west and east elevations but there were no potential gaps around the window frames to allow access to the interior for bats.</p> <p>The roof above Room 2 had stone tiles which appeared to be in good condition, with no obvious cracks/crevices which could be used by crevice-dwelling species of bats. The roof above Room 1 was covered by a temporary plastic sheet/tarpaulin and therefore the roof beneath this area was not visible. Should there be any suitable roost features on the conservatory roof above Room 1 (e.g. gaps under roof tiles), roosting bats may be able to access any such features via gaps between the plastic sheet and the conservatory roof which were visible from ground level.</p> <p>A retaining wall directly bordered the north elevation of the conservatory. The roof of the building was viewed over the top of the retaining wall and the stone roof tiles above Room 3 appeared to be in good condition. There were no obvious potential roost features on this part of the roof, however the results of the internal building inspection (see below) confirmed the presence of a large hole in the south-east corner of Room 3 which would allow access for bats to the interior of Room 3.</p>
Internal	<p>Rooms 1 and 2 comprise the main conservatory building, and these rooms were very well lit due to large windows on the south, east and west elevations. There was no loft/roof void in these rooms, and no obvious place for roosting bats to enter these rooms and/or roost internally, nor any suitable roost features within the rooms. Room 1 was propped with Alcrow props toward the west elevation and there were obvious signs of disrepair.</p> <p>To the rear of the main conservatory rooms was a small corridor (Room 4) which connected the conservatory to the main house and a rear room (Room 3). The rear room (3) had mould on the walls and was generally damp. There were two levels to Room 3 – the ground floor, and a small basement. The basement was accessed via a small staircase in the centre of the room. The basement was very damp, with water on the ground which was a few centimetres deep. The visible basement walls appeared to have no obvious cracks/crevices for roosting bats to use, but parts of the wall could not be surveyed. Above the ground floor room were roof lights which allowed ample natural light into Room 3. A large hole in the south-east corner roof of Room 3 could allow potential access for roosting bats, and gaps around an external door on the south elevation also provided a potential access point. On the ground floor of Room 3 there were several butterfly wings which may indicate feeding remains of bats, and these were located along the centre of the floor space. No other direct signs of roosting bats were recorded internally e.g. bat droppings, urine stains, live bats.</p>

Room 4 had two levels – a ground floor corridor connecting the main house to the conservatory rooms (1-3) and a first-floor level above. The first-floor level was in a state of disrepair and was not fully accessible. Gaps around the wall on the north elevation of the first floor allowed potential access points for bats, and there was a roof void above the first floor which was inaccessible, but which could offer potential roosting habitat for bats.

Due to possible feeding remains in Room 3 and the features present in the building, the building was assessed as having moderate potential to support roosting bats.

4 Discussion and Recommendations

4.1 Discussion

Desk Study

4.1.1 The four non-statutory nature conservation sites identified within 2km of the Site, are 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. Furthermore, the scope of the proposed works is relatively small, being limited to repair/renovations works to the existing conservatory only.

3.1.4 The data search for bats within 2km of the Site 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.

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, two dusk emergence/dawn re-entry surveys are required for the conservatory building to establish presence/absence of roosting bats. If a bat roost is confirmed on these surveys, a third survey 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 Any proposed lighting should be designed sensitively in consultation with a bat ecologist (and informed by the bat emergence/re-entry surveys) to minimise light spill and potential impacts on bats in accordance with best practice, as outlined in Bats and Lighting in the UK (Stone, 2013). This includes:

All luminaires should lack UV elements when manufactured. Metal halide, 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 spectrum (ideally <2700Kelvin or >550nm) should be adopted to reduce blue light component, as redder light is preferable for bats.

<0.2 lux on horizontal is plane good, hedgerow lighting natural tends to be <1lux.

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

Blue/white light should be avoided, or if mercury lamps are installed, these should be fitted with UV filters.

Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.

Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it below horizontal plane.

The use of specialist bollard or low-level downward directional luminaires to retain darkness above can be considered.

Column heights should be carefully considered to minimise light spill.

Reducing the height of light units to keep the light as close to the ground as possible and reduce the volume of illuminated space.

Only luminaires with an upward light ratio of 0% should be used.

Luminaires should always be mounted on the horizontal, i.e. no upward tilt. Ideally the angle of the luminaire should be less than 70 degrees to avoid upward light spill.

Any external security lighting should be set on people-activated motion-sensors and short (1min) timers.

4.1.1 Please note that should 12 months elapse between the surveys and the commencement of the proposed works, an updated PRA will be required.

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 conservatory during the PRA survey. However, the rear conservatory rooms and loft space above Room 4 could be accessed by small bird species. 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 2-2.5m 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.

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.

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

Multi-Agency Geographical Information for the Countryside. <http://magic.defra.gov.uk>

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.

Stone, E.L. 2013. Bats and Lighting: Overview of Current Evidence and Mitigation Guidance. University of Bristol.

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. [REDACTED]

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

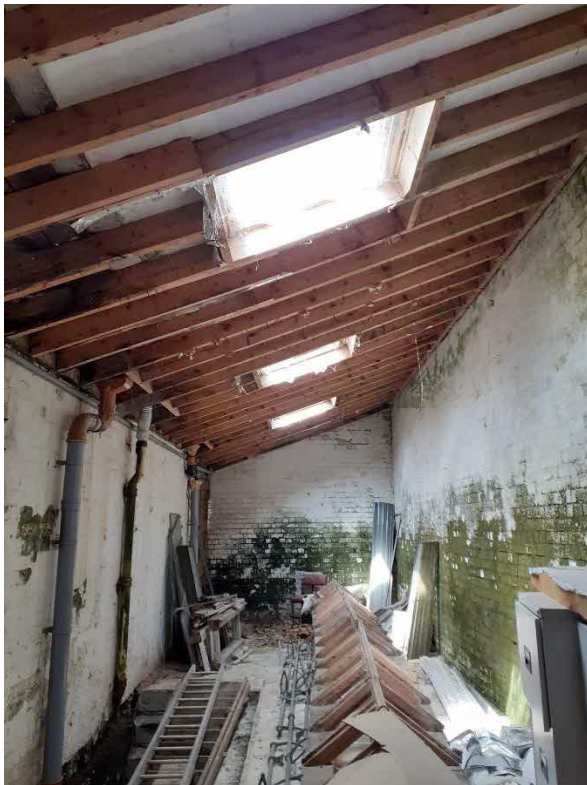
No	Photo	Description
1		South and west elevation of the conservatory at Ebley House, with porch entrance on the south elevation.
2		East elevation of the conservatory with rotten wooden timber around the window frames and tarpaulin/plastic sheet above roof.

No	Photo	Description
3		<p>View of conservatory roof, as seen from over the top of the retaining brick wall. A potential access point to Room 3 was visible on internal inspection (see photograph 10) and the approximate location is circled opposite in red.</p>
4		<p>Red brick retaining wall which conservatory roof is behind, as viewed from adjacent car park.</p>

No	Photo	Description
5	 A wide-angle photograph of a large, empty room with a high, vaulted ceiling. The ceiling features exposed wooden beams and several ceiling fans. The floor is made of light-colored wood. Large windows with white frames and light-colored curtains are visible along the back wall, providing natural light. A fire extinguisher is visible near the windows.	Interior of Room 1, facing west.
6	 A photograph of a dining area within a room with a high, vaulted ceiling. A chandelier hangs from the center of the ceiling. Below it, a dining table is set with a patterned tablecloth and surrounded by wooden chairs. Large windows with white frames and light-colored curtains are visible on the left side, offering a view of greenery outside. A potted plant is placed near the windows.	Interior of Room 2, facing south.

No	Photo	Description
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7

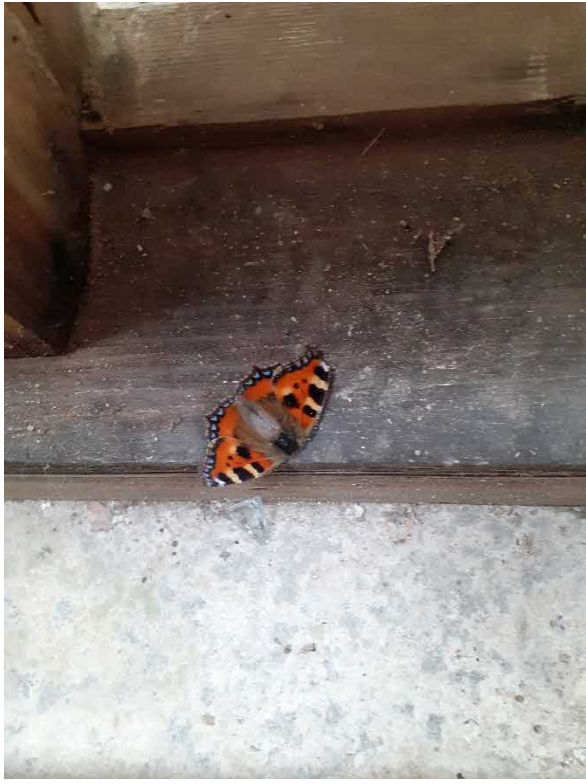
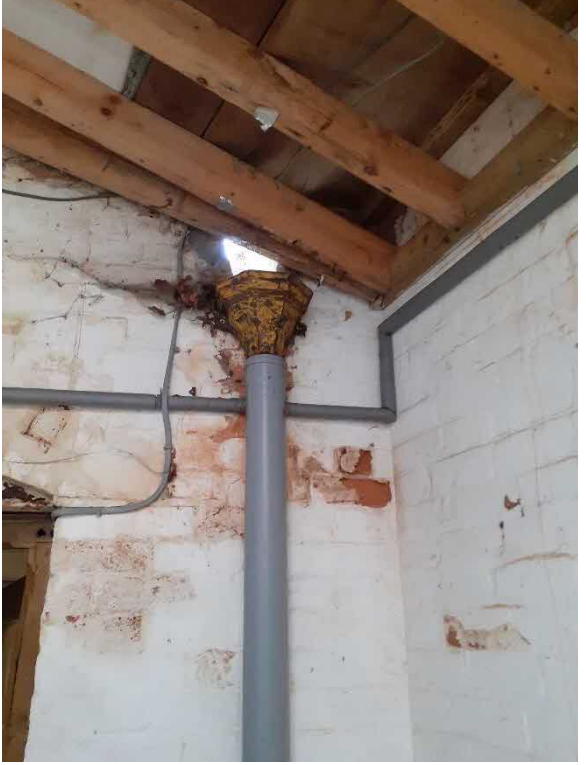




Interior of Room 3, facing west.

8



Basement of Room 3.

No	Photo	Description
9	 A photograph showing a butterfly with orange and black wings resting on a wooden surface. The butterfly is positioned in the center of the frame, with its wings spread. The background is a dark, textured surface, possibly a wall or ceiling, with some debris visible.	<p>One of several butterfly wings found on ground floor of Room 3.</p>
10	 A photograph showing a large hole in the ceiling of Room 3. The hole is located at the south-east corner of the room. The ceiling is made of wooden beams, and a large hole is visible. A grey pipe is visible in the foreground, and the walls are white with some peeling paint. A small light source is visible through the hole in the ceiling.	<p>Large hole at south-east corner of Room 3 provided potential access for bats (see also photograph 3).</p>

No	Photo	Description
11		Gaps between door and west elevation wall of Room 3.
12		Corridor and ground floor level of Room 4, facing west (toward Room 3).

No	Photo	Description
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13





First floor level above the corridor (Room 4), with gaps between timber window boards (circled in red) which provided potential access to the loft above this room.

14



First floor level above the corridor (Room 4), with gaps between outer wall and temporary cover (circled in red).

No	Photo	Description
15		Small open roof void above first floor level of Room 4 which was inaccessible.
16		South elevation of Ebley House, adjacent to the Conservatory.

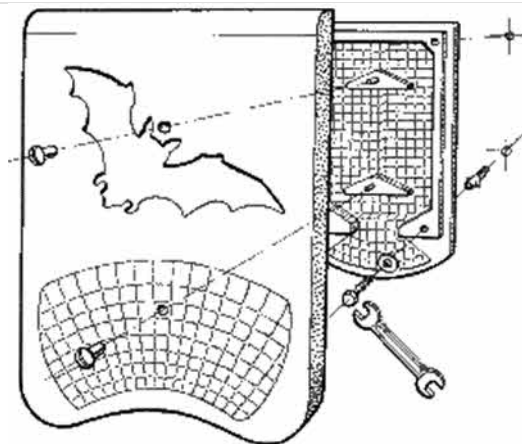
Appendix 3 – Ecological Enhancements

BAT ROOSTING FEATURES

Schwegler 1FF bat box



Schwegler 1WQ Summer & Winter bat



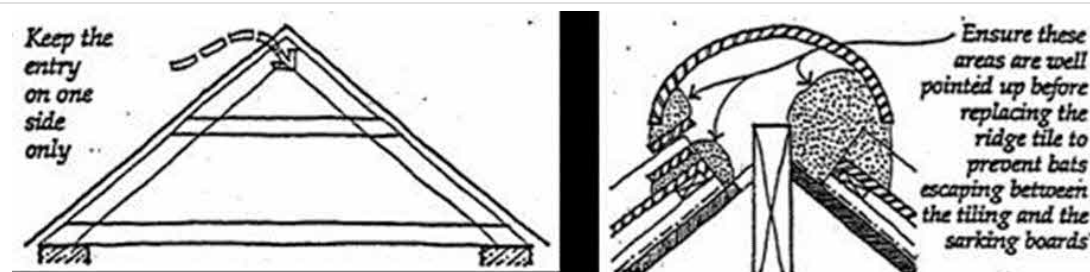
Habibat 001 Bat Box – integral bat box, fitted into wall



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

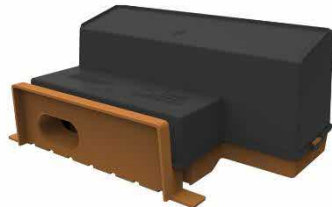
Various designs of swift boxes



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.



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 nov-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

[REDACTED]

[REDACTED] has worked with Wild Service for several years and has recently gained her MSc in Applied Ecology from the University of Gloucestershire. [REDACTED] dissertation project involved large-scale data analysis of biometric bird ringing data to assess biometric changes in UK wintering waterbirds. [REDACTED] 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. [REDACTED] 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. [REDACTED] 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.

[REDACTED]

[REDACTED] 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. [REDACTED] 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. [REDACTED] 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). [REDACTED] 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.

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



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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